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DEN NORSKE NORDHAVS-EXPEDITION

1876—1878.

ZOOLOGI.

FISKE,

VED

ROBERT COLLETT.

MED 5 PLANCHER, 3 TRÆSNIT, OG 1 KART.

CHRISTIANIA.
GRØNDAHL & SØNS BOGTRYKKERI.
1880.

THE NORWEGIAN NORTH-ATLANTIC EXPEDITION

1876—1878.

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ZOOLOGY.

FISHES,

BY

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WITH 5 PLATES, 3 WOODCUTS, AND 1 MAP.

CHRISTIANIA.
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Ifølge Planen for Bearbejdelsen af det videnskabelige Udbytte, der erhvervedes under den norske Nordhavs-Expeditions 3 Togter i Aarene 1876—78, har der i forskjellige Brancher i inden- og udenlandske Tidsskrifter været leveret foreløbige Oversigter, der kortelig have refereret de væsentligste Resultater, eventen saaledes, som disse have foreligget ved Slutningen af hvert enkelt Togt, eller som et samlet Resumé af dem alle.

For de under Expeditionen [illegible] Dybhavsfiskes [illegible] fuldkommen[illegible]de ere [illegible] saadanne foreløbige Oversigter udkomne, begge trykte i „Forhandlinger i Videnskabs-Selskabet i Christiania Aar 1878".[1] Af disse Oversigter, der ikke vare ledsagede af Figurer, udgjør denne General-Beretning en [illegible] forligere, og i flere Henseender suppleret og [illegible] Bearbeidelse.

Medens Udbyttet af Evertebraterne allerede under de 2 første Togter, i 1876 og 1877, viste sig at være [illegible] betydeligt, og frembød Former af den største Interesse, vare de samtidigt indsamlede Fiske forholdsvis faatallige. Dette havde væsentlig sin Grund deri, at de Apparater, der i de nævnte Aar anvendtes til Skrabning eller Optagelse af Bundprøver, ikke vare synderlig tjenlige til disse Dyrs Erhvervelse. Især var dette Tilfældet under det første Togt; Undersøgelserne foregik desuden dette Aar næsten udelukkende paa de store Dybder i den iskolde Area mellem Norge og Island, hvor maaske idethele-taget Fiske-Faunaen er fattigere, end paa flere nordligere Localiteter, hvor Strømningsforholdene bevirke en rigeligere Adgang til Føde, skjønt Bundtemperaturen kan være ligesaa lav. Noget større blev Udbyttet Sommeren 1877, da Undersøgelserne bleve drevne paa det noget grundere Vand, dels paa Bankerne udenfor de norske Kyster, dels i Trakterne af Jan Mayen.

[1] Collett. „Fiske, indsamlede under den norske Nordhavs-Expeditions 2 første Togter, 1876 og 1877". (No. 4, pp. 1—24; foredraget i Mødet den 22de Febr. 1878).
Collett. „Fiske fra Nordhavs-Expeditionens sidste Togt Sommeren 1878". (No. 14, pp. 1—106; foredraget i Mødet d. 13de Dec. 1878).

Pursuant to the resolution for arranging and publishing the fruits of the Norwegian North-Atlantic Expedition, from voyages undertaken in the years 1876, 1877, and 1878, preliminary papers, connected with divers branches of scientific research, have appeared in Norse and foreign journals, giving a summary of the chief results obtained, either progressively, as set forth at the termination of each separate voyage, or comprehensively, as a brief *resumé* of them all.

The deep-sea fishes collected on the Expedition form the subject-matter of two such preliminary memoirs, both of which will be found in "Forhandlinger i Videnskabs-Selskabet i Christiania Aar 1878."[1] These synoptical papers — which were not furnished with figures — have been subjected to a careful revision, and, with the aid of additional data, expanded into the present section of the General Report.

For the invertebrate animals, the results even of the two first voyages, in 1876 and 1877, proved very considerable, yielding forms of the greatest interest, whereas the number of fishes obtained was comparatively small. The chief reason of this, however, lay in the fact of the dredging-apparatus then employed not having been well adapted for securing specimens of these animals. Such showed itself the case more particularly on the first voyage; the investigations, too, in 1876 were carried on almost exclusively at great depths, in the cold area between Norway and the shores of Iceland, where the marine fauna is less rich perhaps than in some localities further north, which the effect of ocean currents has secured a more abundant influx of food, though the temperature at the bottom may be equally low. In the summer of 1877 the results were somewhat greater, the Expedition extending its investigations to shallower water, partly on the banks off the Norwegian coast, and partly in the region adjoining Jan Mayen.

[1] Collett. "Fiske, indsamlede under den norske Nordhavs-Expeditions to første Togter, 1876 og 1877." (No. 4, pp. 1—24; read at Meeting held Feb. 22nd 1878.)
Collett. "Fiske fra Nordh[illegible]vs-Expeditionens sidste Togt Sommeren 1878." (No. 14, pp. 1—106, read at Meeting held Dec. 13th 1878.)

Naar intet Hensyn tages til en Del almindelige Arter, der indsamledes paa ringe Dyb under Opholdet ved de norske Kyster, [illegible] Antallet af de erholdte Dybvandsfiske under disse 2 første Aar: i 1876 1 Art (1 Individ), i 1877 10 Arter (17 Individer). Uagtet sin Faatallighed have disse dog indeholdt Former af ikke ubetydelig Interesse. Dette havde ikke alene sin Grund deri, at de fleste stammede fra Dele af Nordhavet, der i ichthyologisk Henseende vare [illegible] ubekjendte (saaledes Trakterne omkring Jan Mayen); men af de indsamlede Specimina fandtes Arter, der i det Hele vare kun lidet bekjendte, saaledes som Ungerne af *Lycodes esmarkii*, Coll., og af den senere som ny beskrevne *Lycodes frigidus*; fremdeles *Careproctus reinhardi*, Kr. og *Onos septentrionalis*, (Coll.). Endelig var en enkelt, *Lycodes muræna*, tidligere ubeskreven.

Da det ichthyologiske Udbytte saaledes under de 2 første Togter havde i det Hele været mindre, end paaregnet, blev der under Udrustningen til det sidste Togt, i 1878, lagt speciel Vægt paa Anskaffelsen af saadanne Apparater, der ikke blot vare skikkede til at ophente de forskjellige Evertebrater fra de største Dybder, men tillige kunde medbringe Dybvandsfiske, som det maatte antages heller ikke her ganske manglede, naar blot Apparaterne vare istand til at opbringe dem. Et Trawlnet af ganske betydelige Dimensioner blev derfor indrettet væsentlig til dette Brug, og ved en sindrig Mechanisme ombord paa Skibet blev Linens Spænding modereret under Skrabningen; men da et Fangeapparat af denne Construction neppe med Fordel kan benyttes, uden hvor Bunden er flad, og bestaar af Ler eller Sand, blev dets Anvendelse i det Hele indskrænket til et mindre Antal Kast, hvor Bundforholdene tillode dette. Var Bunden stenet eller ujevn, blev Trawlnettet ikke benyttet; ikke destomindre kom det flere Gange op sønderflænget eller knækket, naar det tilfældigvis var kommen til at berøre et klippefuldt Strøg af Bunden; ved én Lejlighed tabtes den hele Trawl tilligemed et Par Tusinde Favne Tougværk.

Denne Anvendelse af Trawlnettet paa de dertil egnede Localiteter kronedes med et uventet Held. Neppe nogensinde gik Trawlen ned, uden at medbringe Fiske, undertiden blot enkelte, men oftest flere. Den Dybde, hvori den nedsendtes, var forskjellig, men gik lige ned til mellem 1300 og 1400 Favne. Aldeles uventet var det at finde Slægten *Lycodes*, hvoraf hidtil, som bekjendt, et kun ganske indskrænket Antal Individer ere kjendte, skjønt Slægten er repræsenteret ved forholdsvis ikke faa Arter, udbredt paa de fleste undersøgte Localiteter, hvor Dybden var nogenlunde betydelig; saaledes erholdtes alene af en enkelt Art (*L. frigidus*, n. sp.) ikke mindre end 15 Individer, de fleste fra en Dybde af mellem 600 og 1300 Favne, eller derover, og næsten alene paa Steder, hvor Vandets Temperatur gik ned til under 0°.

Ialt erholdtes denne Gang af Lycoder 25 Individer, tilhørende 6 Arter, hvoraf 3 vare tidligere ubeskrevne, og 1 beskreven under Beretningen om foregaaende Aars Togt.

Exclusive of a few of the commoner forms taken at a trifling depth off the coast of Norway, the number of deep-sea fishes obtained on the two first voyages was 18, comprising 11 species; in 1876, 1 species (1 individual), in 1877, 10 species (17 individuals). But this result, though comparatively meagre, afforded forms of very considerable interest, — a circumstance to be explained not only by the habitat of several among them lying in tracts of the Northern Ocean hitherto unexplored by ichthyologists, certain of the species secured were likewise of rare occurrence, and in themselves but little known; for instance, the young of *Lycodes esmarkii*, Coll., and of *Lycodes frigidus*, since described as a new species; moreover *Careproctus reinhardi*, Kr., and *Onos septemtrionalis*, (Coll.) [illegible]lly, *Lycodes muræna*, a species not previously describ[illegible]

Thus, the ichthyological results f[illegible]e two first voyages having on the whole proved less [illegible]actory than anticipated, great importance was atta[illegible]hen fitting out the Expedition for the final voyage [illegible]878, to the possibility of procuring apparatus which sh[illegible] adapted not only for securing the [illegible]ious species of i[illegible]rate animals there met w[illegible]ut also for bringing [illegible]p-sea fishes, which there was reason to believe would be found to occur, were suitable apparatus employed for taking them. A trawl-net of very considerable dimensions was therefore constructed, principally with the above object in view, an ingenious piece of mechanism regulating from the deck of the vessel the strain on the line. But fishing-apparatus of this character could not however be employed except for traversing a smooth bottom of clay or sand, and its use was accordingly confined to [illegible] few hauls in specially favourable localities. Wheresoever the bottom proved rugged or uneven, recourse was not had to the trawl-net; but notwithstanding the care thus displayed to prevent accidents, it came up several times in a damaged state, with the meshes torn or the boom broken, having chanced to strike against some rocky projection; nay, on one occasion the entire trawl was lost, together with a couple of thousand fathoms of rope.

The use of the trawl-net in localities for which it is adapted met with eminent and unlooked-for success. Fishes were brought up at well nigh every haul, sometimes indeed two or three only, but more frequently a larger number. The net was worked at various depths, the greatest to which it was sunk being close upon 1400 fathoms. It occasioned no little surprise to find the genus *Lycodes*, — of which but a very limited number of individuals are as yet known, notwithstanding this genus is represented, comparatively by a good many species, — throughout most of the localities investigated where the depth was considerable; thus, for instance, 15 examples were obtained of a single species (*L. frigidus*, n. sp.), the majority at depths ranging from 600 to upwards of 1300 fathoms, and almost exclusively in spots where the temperature of the water was below zero.

The total number of *Lycodes* specimens was 25, comprising 6 species, 3 of which had not previously been described, and 1 for the first time in the Report of the

Denne Slægt, der endnu hører til de i Musæerne allersparsomst repræsenterede Former af den arctiske Fauna, synes saaledes i Virkeligheden af alle Dybvandsfiske at være blandt de talrigste i Ishavets Dyb paa jevn Lerbund, og maa forekomme her i store Mængder; maaske udgjøre de her Hovednæringen for flere andre Rovfiske (*Somniosus*, *Rajae*, etc.) paa Grund af deres noget træge Væsen, hvilken sidste Egenskab det sandsynligvis væsentlig skyldtes, at de saa ofte erholdtes i Trawlnettet.

Det samlede Udbytte under dette sidste Aars Togt udgjorde ialt 33 Arter, hvoraf 6 vare nye for Videnskaben; af de under de 2 foregaaende Togter erhvervede 11 Arter gjenfandtes de 10, hvoriblandt ogsaa den ny opstillede *Lycodes muraena*. De 6 Arter, der maa ansees som tidligere ubeskrevne, ere *Raja hyperborea*, *Liparis (Paraliparis) bathybii*, *Lycodes frigidus*, *Lycodes pallidus*, *Lycodes lütkeni*, samt *Rhodichthys regina*, den sidstnævnte tillige repræsenterende en ny Slægt. Ialt har saaledes Expeditionen bragt 7 nye Arter (og 1 ny Slægt) for Dagen, alle udprægede Dybvandsfiske.

Flere af de øvrige Arter vare kun ufuldstændigt kjendte eller beskrevne, hvilket saaledes var Tilfældet med flere af Lycoderne. En Art, *Onos reinhardi*, (Kr.), havde aldrig været tildelt endog den korteste Diagnose eller Beskrivelse, men dens Benævnelse er alene grundet paa en haandskreven Etikette, og dennes Indførelse i en Catalog. Flere vare ikke tidligere paaviste i den europæiske Fauna, men blot fundne, tildels for længere Tid tilbage, og blot i enkelte Exemplarer, ved de grønlandske Kyster. Vil man saaledes udstrække et Lands eller en Landsdels faunistiske Omraade indtil i omkring 100 Kilometers Afstand fra Kysterne, kan der til Spitsbergens Fauna føjes næsten et Dusin Arter, som tidligere ikke have været omtalte fra denne Øgruppe.

Det i 1878 undersøgte Areal omfattede Strækningen mellem Hammerfest og Varangerfjorden i Syd, Havet henimod Novaja Zemlja i Øst og Jan Mayen i Vest, samt i Nord til Spitsbergens Nordvest-Spidse.

Af de fleste Arter har jeg hos et eller flere Individer undersøgt Ventrikelens Indhold, og til Bestemmelsen af de her forefundne Dyrelevninger har jeg havt en beredvillig Hjælp af Prof. G. O. Sars, hvis Navn er den bedste Garanti for Bestemmelsernes Rigtighed. Denne Undersøgelse af Maveindholdet har desuden havt Interesse ikke blot af den Grund, at den har givet Bidrag til vor Kundskab om visse Evertebraters Udbredelse mod Nord, men ogsaa fordi derved er bleven constateret det ret mærkelige Factum, at flere af disse pelagiske Dyreformer, der væsentlig have været anseede for at have sit Tilhold i Overfladen, formaa at trænge ned til de største Dybder, hvorfra Dybvandsfiskene

preceding voyage. Hence this genus, which must still be regarded as one of the Arctic forms most sparingly represented in museums, would appear to be more numerous than any other of the deep-sea fishes inhabiting the depths of the Polar Sea over a smooth clay bottom; and it occurs no doubt in very considerable quantities. There, perhaps, it constitutes the chief food of other predatory fishes (*Somniosus*, *Rajæ*), owing to its somewhat sluggish movements, a circumstance which probably to a great extent accounts for this fish having been so often captured in the trawl-net.

The number of species secured on this voyage, the last undertaken by the Expedition, amounted in all to 33, 6 of which proved new to science. Of the 11 species obtained on the two preceding voyages, 10 were again met with, including the new species *Lycodes muræna*. The 6 species that must be regarded as not previously known are: — *Raja hyperborea*, *Liparis bathybii*, *Lycodes frigidus*, *Lycodes pallidus*, *Lycodes lütkeni* and *Rhodichthys regina*, the last-mentioned also representing a new genus. The Expedition has thus brought to light 7 new species, (and 1 new genus), all of them true forms of deep-sea fishes.

Several of the remaining species were but imperfectly known and described; this, for instance, was the case with divers of the genus *Lycodes*. One species, *Onos reinhardi*, (Kr.), had not even been made the subject of the briefest diagnosis or description; its designation is traceable to a manuscript label, copied into a catalogue. Several had not previously been shown to occur in the European fauna, but merely found, in some cases years ago and as solitary examples, on the coast of Greenland. Hence, if the area inhabited by the fauna of a country or region be assumed to extend to about 100 kilometres from its shores, we may add to the fauna of Spitzbergen nearly a dozen species of fishes not previously mentioned as occurring off that group of islands.

The region investigated in 1878 comprised, southward, the tract between Hammerfest and the Varanger Fjord, eastward and westward, the expanse of ocean stretching towards Novaja Zemlja and Jan Mayen, and northward, that extending to the north-western extremity of Spitzbergen.

In most of the individuals I have examined the contents of the stomach, and in determining the animal remains found there, Professor G. O. Sars, whose name is a sufficient guarantee for accuracy, has kindly favoured me with his valuable assistance. Moreover, an examination of the stomach and its contents has proved of considerable interest, not only by contributing to our knowledge of the distribution of divers invertebrate species in northern latitudes, but also from its having substantiated the very remarkable fact, that several of these pelagic forms of animal life, whose habitat was generally believed to be near the surf possess the power of descending to the greatest

erhvervedes, og de have her vist sig at kunne opnaa en endog betydeligere Størrelse, end de, der ere kjendte fra de øvre Vandlag. Maaske bør alle disse opfattes som væsentligt beboende de dybere Vandlag, men naar visse gunstige Betingelser ere tilstede, formaa de ogsaa at stige op til Overfladen. Til disse Dyreformer hører fremfor alle Amphipoden *Themisto, libellula*, Mandt (af Hyperidernes Familie), der i store Mængder forekommer paa de fleste Steder i Ishavet; denne Art udgjorde Hovedbestanddelen af de undersøgte Arters Føde, og manglede neppe ganske hos nogen af dem, skjønt disse kunde tilhøre Arter, der beboede omkring 1000 Favnes Dyb, og paa Grund af sin Legemsbygning med Vished kunde antages ikke at være istand til at hæve sig synderligt fra Bunden. Det samme var Tilfældet med enkelte Calanider, og flere andre pelagiske Crustaceer.

Nedenfor meddeles en Fortegnelse over alle de Stationer, paa hvilke Dybvandsfiske erholdtes, tilligemed det paa hver enkelt Station erholdte Udbytte[1].

1876.

Station 33. Storeggen, 174 Kilom. vestenfor Aalesund, Norge (63° 5′ N. B., 3° 0′ Ø. L. f. Gr.), 30te Juni.

1 *Scopelus mülleri*, (Gmel.), i Overfladen.

1877.

Station 124. Banken udenfor Trænen, Helgeland i Norge, 325 Kilom. V.S.V. for Bodø (66° 41′ N. B., 6° 59′ Ø. L.), 19de Juni. Dybden 350 Favne (640m). Bundtemperaturen — 0,9° C. Bunden Ler.

1 *Lycodes frigidus*, jun. (beskreves først senere).

1 *Lycodes esmarkii*, Coll.

1 *Lycodes muraena* n. sp.

Station 164. Banken udenfor Lofoten, Norge, 117 Kilom. vestenfor Røst (68° 21′ N. B., 10° 40′ Ø. L.), 29de Juni. Dybden 457 Favne (836m). Bundtemperaturen — 0,7° C. Bunden graa Sandler.

1 *Lycodes frigidus*, jun. (beskreves først senere).

Røst, Lofoten (67° 31′ N. B., 12° 12′ Ø. L.), 26de Juni. 50—150 Favne (100—280m). Bundtemperaturen + 5° C. Bunden Sandbund.

1 *Onos septentrionalis*, (Coll.).

1 *Glyptocephalus cynoglossus*, (Lin.).

Station 183. Havet nordvest for Lofoten, 354 Kilom. fra Land (69° 59′ N. B., 6° 15′ Ø. L.), 5te Juli. I Overfladen.

4 *Sebastes marinus*, (Lin.), Yngel.

[1] En Del almindelige Former, optagne fra ringe Dyb under Opholdet ved de norske Kyster, ere ikke nærmere omtalte.

in which deep-sea fishes were met with, where they attain even a larger size than those taken in the upper strata of the water. All of these forms should, perhaps, be regarded as occurring chiefly at great depths, but gifted with the faculty of ascending, under certain favourable conditions, to the surface. Among such forms must be ranked above all the Amphipod *Themisto libellula*, Mandt (of the family *Hyperidæ*), which is found in enormous quantities in most parts of the Polar Sea; this animal had constituted the chief food of the species examined, and traces of its presence were probably not altogether wanting in any one of the examples, though belonging even to species that occur at a depth of about 1000 fathoms, and which from their bodily structure may with certainty be assumed not to ascend far from the bottom. Such, too, was the case with the Calanids and other species.

List of stations at which deep-sea fishes were taken, together with a specification of the results for each station.[1]

1876.

Station 33. — Storeggen, 174 kilom. west of Aalesund, Norway (lat. 63° 5′ N., long. 3° 0′ E.), 30th June.

1 *Scopelus mülleri*, (Gmel.); at the surface.

1877.

Station 124. — The bank off Trænen, Helgeland in Norway; 325 kilom. WSW. of Bodø (lat. 66° 41′ N., long. 6° 59′ E.), 19th June; depth 350 fathoms (640m); temperature at bottom — 0.9° C.; clay bottom.

1 *Lycodes frigidus*, jun. (not described till later).

1 *Lycodes esmarkii*, Coll.

1 *Lycodes muræna*, n. sp.

Station 164. — The bank off the Lofoten Islands, Norway, 117 kilom. west of Røst (lat. 68° 21′ N., long. 10° 40′ E.), 29th June; depth 457 fathoms (836m); temperature at bottom — 0.7° C.; bottom: grey sablous clay.

1 *Lycodes frigidus*, jun. (not described till later).

Røst, Lofoten Islands (lat. 67° 31′ N., long. 12° 12′ E.), 26th June; depth 50—150 fathoms (100—280m); temperature at bottom + 5° C.; sandy bottom.

1 *Onos septentrionalis*, (Coll.).

1 *Glyptocephalus cynoglossus*, (Lin.).

Station 183. — The open sea, north-west of the Lofoten Islands, 354 kilom. from land (lat. 69° 59′ N., long. 6° 15′ E.), 5th July; at the surface.

4 *Sebastes marinus*, (Lin.); fry.

[1] The commoner forms obtained at a trifling depth off the Norwegian coast are not included in this report.

Station 223. Østsiden af Jan Mayen (70° 54′ N. B., 8° 24′ V. L.). 1ste August. Dybden 70 Favne (128^m). Bundtemperaturen — 0,6° C. Bunden sort (vulkansk) Sand og Ler.

1 *Icelus hamatus*, Kr.
1 *Triglops pingelii*, Reinh.

Station 224. Østsiden af Jan Mayen (70° 51′ N. B., 8° 20′ V. L.). 1ste August. Dybden 95 Favne (174^m). Bundtemperaturen — 0,6° C. Bunden sort (vulkansk) Sand og Ler.

1 *Icelus hamatus*, Kr.

Station 237. Sydsiden af Jan Mayen (70° 41′ N. B., 10° 10′ V. L.). 3die August. Dybden 263 Favne. (481^m). Bundtemperaturen — 0,3° C. Bunden grovt Grus og Smaastene, især af Lava.

1 *Triglops pingelii*, Reinh.
1 *Careproctus reinhardi*, Kr.
1 *Gymnelis viridis*, (Fabr.).

Station 248. Havet vestenfor Lofoten. 364 Kilom. fra Land (67° 56,5′ N. B., 4° 11′ Ø. L.). 8de August. I Overfladen.

1 *Sebastes marinus*, (Lin.). Yngel.

1878.

Station 261. Tanafjord i Øst-Finmarken (70° 47,5′ N. B., 28° 30′ Ø. L.). 25de Juni. Dybden 127 Favne (232^m). Bundtemperaturen + 2,8° C. Bunden Mudder og Ler.

5 *Raja radiata*, Donov.
2 *Sebastes marinus*, (Lin.).
1 *Glyptocephalus cynoglossus*, (Lin.).
6 *Hippoglossoides platessoides*, (Fabr.).

Station 262. Havet østenfor Vardø, 63 Kilom. fra Land (70° 36′ N. B., 32° 35′ Ø. L.). 27de Juni. Dybden 148 Favne (271^m). Bundtemperaturen + 1,9° C. Bunden Ler.

1 *Centridermichthys uncinatus*, (Reinh.).

Station 275. Havet østenfor Beeren Eiland, 360 Kilom. fra Land (74° 8′ N. B., 31° 12′ Ø. L.). 2den Juli. Dybden 147 Favne (269^m). Bundtemperaturen — 0,4° C. Bunden grønligt Ler.

1 *Sebastes marinus*, (Lin.).
3 *Centridermichthys uncinatus*, (Reinh.).

Station 286. Havet sydvest for Beeren Eiland, 215 Kilom. fra Land (72° 57′ N. B., 14° 32′ Ø. L.). 6te Juli. Dybden 447 Favne (817^m). Bundtemperaturen — 0,8° C. Bunden graagrønt Ler.

18 *Sebastes marinus*, (Lin.). Yngel, i Overfladen.
1 *Platysomatichthys hippoglossoides*, (Wahlb.).

Station 223. — Eastern shore of Jan Mayen (lat. 70° 54′ N., long. 8° 24′ W.), 1st August; depth 70 fathoms (128^m); temperature at bottom — 0.6° C.; bottom: black (volcanic) sand and clay.

1 *Icelus hamatus*, Kr.
1 *Triglops pingelii*, Reinh.

Station 224. — Eastern shore of Jan Mayen (lat. 70° 51′ N., long. 8° 20′ W.), 1st August; depth 95 fathoms (174^m); temperature at bottom — 0.6° C.; bottom: black (volcanic) sand and clay.

1 *Icelus hamatus*, Kr.

Station 237. — Southern shore of Jan Mayen (lat. 70° 41′ N., long. 10° 10′ W.), 3rd August; depth 263 fathoms (481^m); temperature at bottom — 0.3° C.; bottom: coarse sand and shingle, consisting to a great extent of lava.

1 *Triglops pingelii*, Reinh.
1 *Careproctus reinhardi*, Kr.
1 *Gymnelis viridis*, (Fabr.).

Station 248. — The open sea, west of the Lofoten Islands, 364 kilom. from land (lat. 67° 56,5′ N., long 4° 11′ E.), 8th August; at the surface.

1 *Sebastes marinus*, (Lin.); fry-specimen.

1878.

Station 261. — The Tana Fjord, East Finmark (lat. 70° 47,5′ N., long. 28° 30′ E.), 25th June; depth 127 fathoms (232^m); temperature at bottom + 2.8° C.; bottom: mud and clay.

5 *Raja radiata*, Donov.
2 *Sebastes marinus*, (Lin.).
1 *Glyptocephalus cynoglossus*, (Lin.).
6 *Hippoglossoides platessoides*, (Fabr.).

Station 262. — The open sea, east of Vardø, 63 kilom. from land (lat. 70° 36′ N.; long. 32° 35′ E.), 27th June; depth 148 fathoms (271^m); temperature at bottom + 1.9° C.; bottom: clay.

1 *Centridermichthys uncinatus*, (Reinh.).

Station 275. — The open sea, east of Beeren Eiland, 360 kilom. from land (lat. 74° 8′, long. 31° 12′ E.), 2nd July; depth 147 fathoms (269^m); temperature at bottom — 0.4° C.; bottom: greenish clay.

1 *Sebastes marinus*, (Lin.).
3 *Centridermichthys uncinatus*, (Reinh.).

Station 286. — The open sea, south-west of Beeren Eiland, 215 kilom. from land (lat. 72° 57′ N., long. 14° 32′ E.), 6th July; depth 447 fathoms (349^m); temperature at bottom — 0.8° C.; bottom: grey-green sand.

18 *Sebastes marinus*, (Lin.), fry; at the surface.
1 *Platysomatichthys hippoglossoides*, (Wahlb.).

Station 290. Havet midt mellem Beeren Eiland og Hammerfest, 216 Kilom. fra Land (72° 27′ N. B., 20° 51′ Ø. L.) 7de Juli. Dybden 191 Favne (349m). Bundtemperaturen + 3.5° C. Bunden sandholdigt Ler.

4 *Centridermichthys uncinatus*, (Reinh.).
1 *Cottunculus microps*, Coll.

Station 295. Havet vestenfor Hammerfest, 453 Kilom. fra Land (71° 59′ N. B., 11° 40′ Ø. L.), 14de Juli. Dybden 1110 Favne (2030m). Bundtemperaturen — 1,3° C. Bunden *Biloculina*-Ler.

5 *Lycodes frigidus*, n. sp.
3 *Scopelus mülleri*, (Gmel.).

Station 297. Havet midt mellem Nordcap, Jan Mayen og Spitsbergen. 465 Kilometer fra nærmeste Land (72° 36′ N. B., 5° 12′ Ø. L.). 16de Juli. Dybden 1280 Favne (2341m). Bundtemperaturen — 1,4° C. Bunden gulbrun *Biloculina*-Ler.

1 *Rhodichthys regina*, n. gen. & sp.

Station 303. Havet vestenfor Beeren Eiland, 450 Kilom. fra Land (75° 12′ N. B., 3° 2′ Ø. L.). 19de Juli. Dybden 1200 Favne (2195m). Bundtemperaturen — 1,6° C. Bunden brunt Ler.

1 *Lycodes frigidus*, Coll.

Station 312. Havet vestenfor Beeren Eiland, 108 Kilom. fra Land (74° 54′ N. B., 14° 53′ Ø. L.). 22de Juli. Dybden 658 Favne (1203m). Bundtemperaturen — 1,2° C. Bunden brunt og grønt Ler.

1 *Liparis bathybii*, n. sp.
2 *Careproctus reinhardi*, Kr.
2 *Onos reinhardi*, (Kr.)
1 *Lycodes muraena*, Coll.
5 *Lycodes frigidus*, Coll.

Station 323. Havet midt mellem Nordcap og Beeren Eiland, 180 Kilom. fra Land (72° 53,5′ N. B., 21° 51′ Ø. L.), 30te Juli. Dybden 223 Favne (408m). Bundtemperaturen + 1,5° C. Bunden brungraat Ler.

1 *Centridermichthys uncinatus*, (Reinh.).
1 *Agonus decagonus*, Schn.
1 *Hippoglossoides platessoides*, (Fabr.).

Station 326. Havet midt mellem Spitsbergen og Beeren Eiland, 105 Kilom. fra Land (75° 31′ N. B., 17° 50′ Ø. L.), 3die August. Dybden 123 Favne (225m). Bundtemperaturen + 1,6° C. Bunden mørkt Ler.

1 *Raja radiata*, Donov.
2 *Sebastes marinus*, (Lin.).
3 *Centridermichthys uncinatus*, (Reinh.).
6 *Agonus decagonus*, Schn.
1 *Gadus saida*, Lepech.
15 *Hippoglossoides platessoides*, (Fabr.).

Station 290. — The open sea, midway between Beeren Eiland and Hammerfest, 216 kilom. from land (lat. 70° 27′ N., long. 20° 51′ E.), 7th July; depth 191 fathoms (349m); temperature at bottom + 3.5° C.; bottom: sabulous clay.

4 *Centridermichthys uncinatus*, (Reinh.).
1 *Cottunculus microps*, Coll.

Station 295. — The open sea, west of Hammerfest, 453 kilom. from land (lat. 71° 59′ N., long. 11° 40′ E.), 14th July; depth 1110 fathoms (2030m); temperature at bottom — 1.3° C.; bottom: *biloculina*-clay.

5 *Lycodes frigidus*, Coll.
3 *Scopelus mülleri*, (Gmel.).

Station 297. — The open sea, midway between the North Cape, Jan Mayen and Spitzbergen, 465 kilom. from land (lat. 72° 36′ N., long. 5° 12′ E.). 16th July; depth 1280 fathoms (2341m); temperature at bottom — 1.4° C.; bottom: yellowish brown *biloculina*-clay.

1 *Rhodichthys regina*, n. gen. & sp.

Station 303. — The open sea, west of Beeren Eiland, 450 kilom. from land (lat. 75° 12′ N., long. 3° 2′ E.), 19th July; depth 1200 fathoms (2195m); temperature at bottom — 1.6° C.; bottom: brown clay.

1 *Lycodes frigidus*, Coll.

Station 312. — The open sea, west of Beeren Eiland, 108 kilom. from land (lat. 74° 54′ N., long. 14° 53′ E.), 22nd July; depth 658 fathoms (1203m); temperature at bottom — 1.2° C.; bottom: brown and green clay.

1 *Liparis bathybii*, n. sp.
2 *Careproctus reinhardi*, Kr.
2 *Onos reinhardi*, (Kr.).
1 *Lycodes muræna*, Coll.
5 *Lycodes frigidus*, Coll.

Station 323. — The open sea, midway between the North Cape and Beeren Eiland, 180 kilom. from land (lat. 72° 53′, 5″ N., long. 31° 51′ E.), 30th July; depth 223 fathoms (408m); temperature at bottom + 1.5° C.; bottom: brownish grey clay.

1 *Centridermichthys uncinatus*, (Reinh.).
1 *Agonus decagonus*, Schn.
1 *Hippoglossoides platessoides*, (Fabr.).

Station 326. — The open sea, midway between Spitzbergen and Beeren Eiland, 105 kilom. from land (lat. 75° 31′ N., long. 17° 50′ E.), 3rd August; depth 123 fathoms (225m); temperature at bottom + 1.6° C.; bottom: dark clay.

1 *Raja radiata*, Donov.
2 *Sebastes marinus*, (Lin.).
3 *Centridermichthys uncinatus*, (Reinh.).
6 *Agonus decagonus*, Schn.
1 *Gadus saida*, Lepech.
15 *Hippoglossoides platessoides*, (Fabr.).

Station 338. Udenfor Sydcap, Spitsbergen (76° 22′ N. B., 17° 13′ Ø. L.), 6te August. Dybden 146 Favne (267m). Bundtemperaturen — 1,1° C. Bunden Stenbund.

1 *Agonus decagonus*, Schn.

Station 353. Havet vestenfor Isfjorden, Vest-Spitsbergen, 230 Kilom. fra Land (77° 59′ N. B., 5° 10′ Ø. L.), 10de August. Dybden 1333 Favne (2438m). Bundtemperaturen — 1,4° C. Bunden *Biloculina*-Ler og Smaastene.

3 *Lycodes frigidus*, Coll.

Station 362. Havet vestenfor Norsk-Øerne, Nordvest-Spitsbergen, 115 Kilom. fra Land (79° 59′ N. B., 5° 40′ Ø. L.), 14de August. Dybden 459 Favne (839m). Bundtemperaturen — 1,0° C. Bunden blaagraat Ler.

1 *Raja hyperborea*, n. sp.
2 *Raja radiata*, Donov.
1 *Cottunculus microps*, Coll.
2 *Lycodes esmarkii*, Coll.
1 *Lycodes lütkeni*, n. sp.
1 *Lycodes pallidus*, n. sp.
2 *Lycodes muraena*, Coll.

Station 363. Havet vestenfor Norsk-Øerne, Nordvest-Spitsbergen, 60 Kilom. fra Land (80° 3′ N. B., 8° 28′ Ø. L.), 14de August. Dybden 260 Favne (475m). Bundtemperaturen + 1,1° C. Bunden Blaaler.

1 *Agonus decagonus*, Schn.
1 *Cottunculus microps*, Coll.
1 *Lycodes frigidus*, Coll.
1 *Lycodes esmarkii*, Coll.
1 *Lycodes pallidus*, Coll.
1 *Lycodes seminudus*, Reinh.

Norsk-Øerne, Nordvest-Spitsbergen (79° 51′ N. B., 11° 45′ Ø. L.), 15de August. Dybden ubetydelig.

1 *Cottus scorpius*, Lin.
3 *Liparis lineatus*, (Lepech.).
1 *Gadus saida*, Lepech.
3 *Gymnelis viridis*, (Fabr.).

Station 366. Magdalenebay, Nord-Spitsbergen (79° 35′ N. B., 11° 17′ Ø. L.), 17de August. Dybden 37—61 Favne (75—112m). Bundtemperat. fra — 0,2° indtil — 2,1° C. Bunden mørkgraat Ler med løsrevne Alger og Smaasten.

1 *Icelus hamatus*, Kr.
1 *Triglops pingelii*, Reinh.
8 *Gymnacanthus pistilliger*, (Pall.).
1 *Liparis lineatus*, (Lepech.).
1 *Lumpenus maculatus*, (Fries).
4 *Lumpenus medius*, Reinh.
1 *Lumpenus lampetraeformis*, (Walb.).
72 *Gadus saida*, Lepech.

Station 338. — Off the South Cape, Spitzbergen (lat. 76° 22′ N., long. 17° 13′ E.), 6th August; depth 146 fathoms (267m); temperature at bottom — 1.1° C.; rocky bottom.

1 *Agonus decagonus*, Schn.

Station 353. — The open sea, west of the Isfjord, western coast of Spitzbergen, 230 kilom. from land (lat. 77° 59′ N., long. 5° 10′ E.), 10th August; depth 1333 fathoms (2438m); temperature at bottom — 1.4° C.; bottom: *biloculina*-clay and shingle.

3 *Lycodes frigidus*, Coll.

Station 362. — The open sea, west of the Norsk Islands, north-western coast of Spitzbergen, 115 kilom. from land (lat. 79° 59′ N., long. 5° 40′ E.), 14th August; depth 459 fathoms (839m); temperature at bottom — 1.0° C.; bottom: bluish grey clay.

1 *Raja hyperborea*, n. sp.
2 *Raja radiata*, Donov.
1 *Cottunculus microps*, Coll.
2 *Lycodes esmarkii*, Coll.
1 *Lycodes lütkeni*, n. sp.
1 *Lycodes pallidus*, n. sp.
2 *Lycodes murœna*, Coll.

Station 363. — The open sea, west of the Norsk Islands, north-western coast of Spitzbergen, 60 kilom. from land (lat. 80° 3′ N., long. 8° 28′ E.), 14th August; depth 260 fathoms (475m); temperature at bottom + 1.1° C.; bottom: blue clay.

1 *Agonus decagonus*, Schn.
1 *Cottunculus microps*, Coll.
1 *Lycodes frigidus*, Coll.
1 *Lycodes esmarkii*, Coll.
1 *Lycodes pallidus*, Coll.
1 *Lycodes seminudus*, Reinh.

Norsk Islands, north-western coast of Spitzbergen (lat. 79° 51′ N., long. 11° 45′ E.), 15th August; depth trifling.

1 *Cottus scorpius* (Lin.).
3 *Liparis lineatus*, (Lepech.).
1 *Gadus saida*, Lepech.
3 *Gymnelis viridis*, (Fabr.).

Station 366. — Magdalena Bay, north coast of Spitzbergen (lat. 79° 35′ N., long. 11° 17′ E.), 17th August; depth 37—61 fathoms (75—112m); temperature at bottom as low as — 2.1° C.; bottom: dark-grey clay and shingle.

1 *Icelus hamatus*, Kr.
1 *Triglops pingelii*, (Reinh.).
8 *Gymnacanthus pistilliger*, (Pall.).
1 *Liparis lineatus*, (Lepech.).
1 *Lumpenus maculatus*, (Fries).
4 *Lumpenus medius*, Reinh.
1 *Lumpenus lampetræformis*, (Walb.).
72 *Gadus saida*, Lepech.

Isfjorden. Vest-Spitsbergen (78° 9′ N. B., 14° 12′ Ø. L.), 19de August. Dybden 129 Favne (236ᵐ). Bundtemperaturen + 1.2° C. Bunden Stenbund.

1 *Eumicrotremus spinosus*, (Müll.).

Station 374. Advent Bay, Isfjorden, Vest-Spitsbergen (78° 16′ N. B. 15° 38′ Ø. L.), 22de August. Dybden 60 Favne (110ᵐ). Bundtemperaturen + 0.7° C. Bunden mørkt Ler.

3 *Lumpenus medius*, Reinh.

Det samlede Antal har saaledes tilhørt følgende 32 Arter:

Rajidae.
Raja hyperborea, n. sp. 1878. *Raja radiata*, Donov. 1808.

Scorpaenidae.
Sebastes marinus, (Lin.) 1766.

Cottidae.
Cottunculus microps, Coll. 1874. *Cottus scorpius*, Lin. 1766. *Gymnacanthus pistilliger*, (Pall.) 1811. *Centridermichthys uncinatus*, (Reinh.) 1833—34. *Icelus hamatus*, Kr. 1844. *Triglops pingelii*, Reinh. 1838.

Agonidae.
Agonus decagonus, Schn. 1801.

Cyclopteridae.
Eumicrotremus spinosus, (Müll.) 1776.

Liparididae.
Liparis lineatus, (Lepech.) 1774. *Liparis bathybii*, n. sp. 1878. *Careproctus reinhardi*, Kr. 1862.

Blenniidae.
Lumpenus medius, Reinh. 1838. *Lumpenus maculatus*, (Fries) 1837. *Lumpenus lampetraeformis*, (Wahlb.) 1792.

Lycodidae.
Lycodes esmarkii, Coll. 1874. *Lycodes frigidus*, n. sp. 1878. *Lycodes lütkeni*, n. sp. 1880. *Lycodes pallidus*, n. sp. 1878. *Lycodes seminudus*, Reinh. 1838. *Lycodes muraena*, n. sp. 1878. *Gymnelis viridis*, (Fabr.) 1780.

Gadidae.
Gadus saida, Lepech. 1774. *Onos reinhardi*, (Kr.) MS. 185?. *Onos septemtrionalis*, (Coll.) 1874.

Pleuronectidae.
Platysomatichthys hippoglossoides, (Wahlb.) 1792. *Hippoglossoides platessoides*, (Fabr.) 1780. *Glyptocephalus cynoglossus*, (Lin.) 1766.

Ophidiidae.
Rhodichthys regina, n. gen. & sp. 1878.

Scopelidae.
Scopelus mülleri, (Gmel.) 1788.

The Isfjord, western coast of Spitzbergen (lat. 78° 9′ N., long. 14° 12′ E.), 19th August; depth 129 fathoms (236ᵐ); temperature at bottom + 1.2° C.; bottom rocky.

1 *Eumicrotremus spinosus*, (Müll.).

Station 374. — Advent Bay, west coast of Spitzbergen (lat. 78° 16′ N., long. 15° 38′ E.), 22nd August; depth 60 fathoms (110ᵐ); temperature at bottom + 0.7° C.; bottom: dark clay.

3 *Lumpenus medius*, Reinh.

The individuals collected on the Expedition comprised accordingly the following species, 32 in number: —

Rajidæ.
Raja hyperborea, n. sp. 1878. *Raja radiata*, Donov. 1808.

Scorpaenidæ.
Sebastes marinus, (Lin.) 1766.

Cottidæ.
Cottunculus microps, Coll. 1874. *Cottus scorpius*, Lin. 1766. *Gymnacanthus pistilliger*, (Pall.) 1811. *Centridermichthys uncinatus*, (Reinh.) 1833—34. *Icelus hamatus*, Kr. 1844. *Triglops pingelii*, Reinh. 1838.

Agonidæ.
Agonus decagonus, Schn. 1801.

Cyclopteridæ.
Eumicrotremus spinosus, (Müll.) 1776.

Liparididæ.
Liparis lineatus, (Lepech.) 1774. *Liparis bathybii*, n. sp. 1878. *Careproctus reinhardi*, Kr. 1862.

Blenniidæ.
Lumpenus medius, Reinh. 1838. *Lumpenus maculatus*, (Fries) 1837. *Lumpenus lampetræformis*, (Wahlb.) 1792.

Lycodidæ.
Lycodes esmarkii, Coll. 1874. *Lycodes frigidus*, n. sp. 1878. *Lycodes lütkeni*, n. sp. 1880. *Lycodes pallidus*, n. sp. 1878. *Lycodes seminudus*, Reinh. 1838. *Lycodes muræna*, n. sp. 1878. *Gymnelis viridis*, (Fabr.) 1780.

Gadidæ.
Gadus saida, Lepech. 1774. *Onos reinhardi*, (Kr.) MS. 185?. *Onos septemtrionalis*, (Coll.) 1874.

Pleuronectidæ.
Platysomatichthys hippoglossoides, (Wahlb.) 1792. *Hippoglossoides platessoides*, (Fabr.) 1780. *Glyptocephalus cynoglossus*, (Lin.) 1766.

Ophidiidæ.
Rhodichthys regina, n. gen. & sp. 1878.

Scopelidæ.
Scopelus mülleri, (Gmel.) 1788.

Norske Nordhavs-Expedition. R. Collett. Fiske.

Den private Opmaalings lith. Anstalt, Kristiania.

A. Palaeichthyes.

Subord. Plagiostomata.

Fam. Rajidae.

Gen. Raja, Lin.

Syst. Nat. ed. 12, tom. 1, p. 395 (1766).

1. **Raja hyperborea,** Coll. 1878 (n. sp.).

Pl. I., fig. 1—2.

Raja hyperborea, Coll. Forh. Vid. Selsk. Chra. 1878, No. 14, p. 7.

Diagn. *Snuden tilspidset, af middels Længde; Snudespidsens Afstand fra Øjet udgjør ikke fuldt det dobbelte af Interorbitalrummets Bredde. Legemet noget bredere, end dets Længde fra Snudespidsen til Enden af de accessoriske Generationsorganer. Halen forholdsvis kort, indeholdes 3 Gange i Totallængden. Tænderne (hos Hannen) spidse og slanke, danne i Overkjæven omtrent 36, i Underkjæven 42 Tverrækker. Oversiden er ru, samt beklædt med større Torne; Undersiden er glat. De større Rygtorne ere 6 i Antal; Haletornene, der danne en enkelt Række, ere 17. Mellem de 2 Dorsaler sidder en liden Torn. Farven oventil mørkt graabrun, Undersiden hvid med store, lateralt-symmetriske Felter af Oversidens Farve.*

Localit. fra Nordh.-Exped. Havet vestenfor Nord-Spitsbergen.

	Stat. 362.
Beliggenhed.	115 Kilom. V. Norskøerne, Spitsbergen.
Dybde.	459 Favne (839m).
Temp. paa Bunden.	— 1,0° C.
Bunden.	Blaagraat Ler.
Datum.	14de August 1878.
Antal Individer.	1 Ind. (en Han).

Udmaalinger.

Totallængde (Han) 518mm

Legemets Længde til Spidsen af Hjælpegenitalierne . . . . 390 -

A. Palæichthyes.

Subord. Plagiostomata.

Fam. Rajidæ.

Gen. Raja, Lin.

Syst. Nat. ed. 12, tom. 1, p. 395 (1766).

1. **Raja hyperborea,** Coll. 1878 (n. sp.).

Pl. I. fig. 1—2.

Raja hyperborea, Coll. Forh. Vid. Selsk. Chra. 1878, No. 14, p. 7.

Diagnosis. — *Snout pointed, of moderate length; distance from end of snout to the orbit not quite double the width of the interorbital space. The transverse diameter of the disk somewhat greater than its length from the snout to the termination of the accessory sexual appendages. The tail comparatively short, one-third of the total length. Teeth (in the male) sharp and slender, about 36 transverse rows in the upper and 42 in the lower jaw. The upper surface rough, and armed with spines; under surface smooth. The larger dorsal spines are 6 in number; the tail is furnished with 17, in a single row; and a small spine occurs between the 2 dorsal fins. The colour of the upper surface is a dark greyish brown, that of the under plain white, with large, laterally-symmetrical brown patches.*

Locality (North Atl. Exped.): — The open sea, west of the northern coast of Spitzbergen.

	Stat. 362.
Exact Locality.	115 Kilom. W. of the Norsk Islands, Spitzbergen.
Depth.	459 Fathoms (839m).
Temp. at Bottom.	— 1.0° C.
Bottom.	Bluish-grey Clay.
Date.	14th August 1878.
Numb. of Specim.	1 Indiv. (a male).

Measurements.

Total length (male) 518mm

Length of body to the termination of the accessory sexual appendages . . . . 390 -

Største Bredde mellem Pectoralernes Spidse	405 mm
Halens Længde	168 -
Snudespidsen til Øjets Forrand	90 -
Bredden mellem Øjnene	49 -
Snudespidsen til Pectoralens Spidse (Legemets forreste Profil-Linie)	305 -
Pectoralspidsen til Ventralens bagre Spidse (Legemets bagre Profil-Linie)	175 -
Hjælpegenitaliernes Længde	48 -
Snudespidsen til Næseborene	77 -
Afstanden mellem Næseborene	64 -
Bredden af Mundspalten	66 -
Ventralernes Grundlinie	86 -
Ventralernes største Længde	110 -
Halens Bredde ved Roden	26 -
Halens Bredde ved Begyndelsen af 1ste Dorsal	15 -
Halens Højde ved Roden	12 -
Halens Højde ved Begyndelsen af 1ste Dorsal	5 -
Fra Dorsalernes Begyndelse til Halespidsen	59 -
1ste Dorsals Grundlinie	19 -
1ste Dorsals Højde	15 -
2den Dorsals Grundlinie	21 -
2den Dorsals Højde	13 -
Øjets Længdediameter	14 -
Tverdiameter af Spiracula	11 -
Snudespidsen til 1ste Gjællespalte	148 -
Bredden mellem 1ste Gjællespalte paa hver Side	110 -

Beskrivelse. *Legemsbygning.* Snuden er tilspidset, dog ikke særdeles uddragen; dens Længde indtil Øjets forreste Rand er knapt dobbelt saa stor, som Pandens Bredde mellem Øjnene.

Legemets største Bredde mellem Pectoralernes Spidse er større, end Legemets Længde fra Snudespidsen til Enden af Hjælpegenitalierne. Legemets forreste Profillinie er næsten ret indtil i Højde med Kjæverne; derpaa er den noget concav, indtil ud mod Spidsen af Pectoralerne, der paa hver Side danne en temmelig afrundet Vinkel. Legemets bagre Profillinie, der kun har noget over den forreste Linies halve Længde, er næsten ret, kun i sit bagre Hjørne noget afrundet, og idethele parallel med den modsatte forreste Linie, saaledes at Legemet næsten danner et Parallelogram.

Halen er paa Undersiden fuldkommen flad, men har oventil afrundede Sider; den er dog idethele fladtrykt, idet Bredden overalt er betydelig større, end Højden (ved Roden dobbelt, ved Begyndelsen af 1ste Dorsal tredobbelt større). En distinct afsat Hudfold løber langs Halens hele Længde paa hver Side af Underfladen. I Forhold til Legemet er Halen kort, idet den blot udgjør 1 Trediedel af Totallængden.

De accessoriske Generationsorganer ere hos det eneste undersøgte Individ ikke særdeles lange; deres Længde omtrent lig Pandens Bredde mellem Øjnene.

Tænderne ere forholdsvis lange og spinkle, med særdeles liden Grundflade. Sandsynligvis har dog Hunnen kortere, og ved Grunden bredere Tænder. I hver Kjævehalvdel findes oventil 18, nedentil 21 Tverrækker, saaledes

Greatest distance between the pectorals	405 mm
Length of tail	168 -
From point of snout to the eye	90 -
Interorbital space	49 -
From point of snout to the extremity of the pectoral fin	305 -
From the extremity of the pectoral fin to the posterior extremity of the ventral	175 -
Length of sexual appendages	48 -
From point of snout to nostrils	77 -
Distance between the nostrils	64 -
Width of mouth	66 -
Ventrals at base	86 -
Extreme length of ventrals	110 -
Breadth of tail at base	26 -
Breadth of tail at commencement of first dorsal fin	15 -
Depth of tail at base	12 -
Depth of tail at commencement of first dorsal fin	5 -
From the first dorsal to the tip of the tail	59 -
First dorsal at base	19 -
Height of first dorsal	15 -
Second dorsal at base	21 -
Height of second dorsal	13 -
Longitudinal diameter of orbit	14 -
Transverse diameter of spiracles	11 -
From point of snout to first branchial aperture	148 -
Width between first branchial aperture on each side	110 -

Description. *Structure of the Body.* — The snout terminates in a point, without however being greatly produced. Length from tip to the anterior margin of the orbit a trifle less than twice the interorbital space.

The diameter of the disk across the pectorals exceeds the distance from the point of the snout to the termination of the sexual appendages. The anterior free margin almost straight up to the jaws; from thence slightly concave to the tips of the pectorals, the extreme lateral angle of each being rather convex. The posterior free margin, but little more than half the length of the anterior marginal line, is almost straight — the hindmost part only being slightly convex — and running as it does nearly parallel to the anterior margin, the disk closely resembles a rhomboid.

The under surface of the tail is perfectly flat, the sides of the upper are rounded; its general appearance is depressed, the breadth greatly exceeding the vertical thickness (at the origin twice, at the commencement of the first dorsal three times as great). A cutaneous flap, distinctly developed, extends along the entire length of the tail on each side of the under surface. Tail short in proportion to the body, being only one-third of the total length.

The accessory sexual appendages are not particularly long in the specimen examined, their length being about equal to the width of the interorbital space.

The teeth are comparatively long and slender, and exceedingly narrow at the base. Probably the females have shorter teeth with broader bases. The upper jaw is furnished with 18, the lower with 21 transverse rows in each

ialt $\frac{36}{42}$ Tverrækker. Mundspaltens Bredde udgjør ikke fuldt Halvdelen af Afstanden fra Snudespidsen til 1ste Gjællespalte.

Den forreste af de 5 Gjællespalter ligger i en Afstand fra Mundvinkelen, der omtrent er lig dens egen Afstand fra den bagerste Gjællespalte.

Spiracula er forholdsvis vid, idet dets Tverdiameter er omtrent lig den ubedækkede Del af Øjet; det er stillet ikke skraat bagenfor dette, men fuldkommen tvers mod Øjets Længdediameter.

Finnerne. Ventralerne have henimod Spidsen et dybt Indsnit, der fortil lader frit et kegleformigt, noget udspærret Parti, der dog er af forholdsvis ringere Højde, idet det blot udgjør Halvdelen af den hele Finnes Grundlinie, eller omtrent Trediedelen af Finnens hele Længde til den bagre Spidse.

1ste Dorsal begynder i en Afstand fra Halespidsen, der indeholdes $2^5/_6$ Gange i Halens hele Længde. Dens Grundlinie er ubetydelig større, end dens Højde; den bagre Spidse er noget tilspidset, og den lodrette Bagrand lidt concav.

2den Dorsal er adskilt fra 1ste gjennem et ubetydeligt Mellemrum (opfyldt af en mindre Torn). Den er lavere, end 1ste Dorsal, idet Højden er kun lidt over Halvdelen af Grundlinien. Dens bagre Spidse er stærkt nedadbøjet, dog tilspidset, saaledes, at dens lodrette Bagrand er temmelig kort.

En Antydning til en Caudal findes i Form af en kort og lav, vertical Hudflig, der rager ubetydeligt udenfor Halespidsen, og har paa Halespidsens Underside en kort Kjøl.

Hudens Beklædning. Oversiden er ru, samt tildels beklædt med større Torne; Undersiden er glat.

De større Torne findes blot 1) over Øjnene, 2) paa Skulderpartiet, samt 3) midt nedad Ryggen og Halen; de ere alle riflede fra Grunden udad mod Spidsen, der er yderst skarp, og noget bagudbøjet; de ere ikke synderlig høje, undtagen paa Halens øvre Del. Deres samlede Antal er hos det undersøgte Individ 37.

Øjentornene ere ialt 6 i Antal, og danne paa hver Side en fuldkommen ret Linie (bestaaende af 3 Torne) indenfor Øjeranden, saaledes, at Afstanden mellem begge Linier bliver mindre, end Pandens Bredde mellem Øjnene. 1ste Torn er stillet foran, 2den bagenfor Øjets øvre Rand, 3die umiddelbart bagenfor Spiracula. 1ste Torn ligger i en Afstand fra Snudespidsen, der omtrent er dobbelt saa stor, som Rækkernes indbyrdes Afstand; 1ste og 3die Torn danne med de tilsvarende i den modsatte Række et næsten fuldkomment Qvadrat.

Skulderpartiet bærer i Midten en Række af 3, og paa hver Side en Række af 2, tilsammen 7 Torne. Sidetornene sidde tættere sammen, end Midtrækkens Torne, og have idethele samme Afstand indbyrdes, som mellem 2den og 3die Øjentorn (14^{mm}), eller noget over en Øjendiameter. Den bagerste Torn i Midtrækken danner med den bagerste Torn i hver af Siderækkerne en næsten ret Linie. Afstanden mellem 1ste og 3die Torn i Midtrækken er næsten saa

half, the total number of transverse series being thus $\frac{36}{42}$. Width of mouth not quite equal to half the distance from point of snout to first branchial aperture.

The foremost of the five branchial apertures is about the same distance from the angle of the mouth as it is from the hindmost aperture.

The spiracles are comparatively large, their transverse diameter being nearly equal to the width of the uncovered portion of the eye; their position is not oblique, but strictly vertical to the longitudinal diameter of the orbit.

Fins. — Towards their extremity, the ventrals are distinguished by a deep incision, exposing to view a cuneiform and somewhat expanded part, the height of which however is inconsiderable, being not more than half of the base of the fin, and but one-third of its entire length to the posterior extremity.

The first dorsal commences at a distance from the tip of the tail which is to the entire length of the tail as 1 to $2^5/_6$; basal line a trifle longer than the vertical height; posterior extremity pointed, posterior perpendicular margin slightly concave.

Second dorsal nearly contiguous to first, the intervening space being occupied by a diminutive spine. Height less than that of the first dorsal, hardly exceeding half the length of the basal line; the posterior extremity directed downwards and terminating in a point; the posterior perpendicular margin is consequently somewhat short.

Caudal fin rudimentary, having the appearance of a vertical membraneous lappet, furnished on the under surface of the extremity of the tail with a keel-shaped ridge, projecting but slightly beyond the tip.

Armature of the skin. — Upper surface rough and partially studded with powerful spines; under surface smooth.

The large spines occur: — 1) above the eyes; 2) on the humeral region; 3) along the mesial line of the disk and the central ridge of the tail. All the spines are grooved from the base up to the point, which is exceedingly sharp and slightly hooked; the longest are in the row on the upper part of the tail. Total number in the specimen examined 37.

The spines about the eyes are 6 in number, arranged in two lines, perfectly straight (three spines in each), one on either side within the margin of the eye, making the distance between them a trifle less than the width of the interorbital space. The first spine is placed before, the second above the upper margin of the eye, the third immediately behind the spiracles. Distance of first spine from point of snout about double that between the rows; the first and third spines form with the corresponding spines on the opposite side an almost perfect square.

The humeral region is furnished with 7 spines, a row of 3 along the dorsal ridge and 2 on either side. The lateral spines are more closely set than those disposed along the mesial line, their relative distance being nearly equal to that between the second and third spines in the series above the eyes (14^{mm}), or slightly exceeding the longitudinal diameter of the eye. The hindmost spine in the central series is almost in a line with the hindmost spine in each

stor, som mellem 1ste og 3die Øjentorn; noget større er derimod Afstanden mellem Midtrækken og hver af Siderækkerne.

Rygtornene ere 6 i Antal, der danne en enkelt Række, hvori Mellemrummet mellem hver Torn har omtrent samme Længde, som mellem 1ste og 2den Torn i Øjenrækkerne (25mm), eller mellem 1ste og 2den Torn i Skulderpartiets Midtrække. Rygtornenes Række ophører et kort Stykke foran Halen.

Haletornene danne en enkelt Række, bestaaende af 17 Torne, der staa tættere sammen, end Rygtornene, og tiltage i Størrelse indtil den 6te, men aftage derefter indtil den sidste, der er ganske liden og sidder tæt ind til 1ste Dorsal. Rækken begynder i nogen Afstand fra sidste Rygtorn. Endelig findes en liden Torn mellem de 2 Dorsaler, den 18de.

Hele Oversiden er forøvrigt ru af særdeles smaa og spidse Smaatorne, der intetsteds naa tilnærmelsesvis den samme Størrelse, som de større Torne. Dog er et Parti langs Legemets forreste Siderand (omtrent ret udenfor Øjnene) beklædt med noget større Torne, end de øvrige Smaatorne; disse udgjøre de for Hannerne ejendommelige „Kardetorne" (*carmines maris*, ifølge Fries). Ligeledes findes enkelte noget længere Torne langs Midten af Snuden. Glat er blot den bagre Rand af Pectoralerne, hele Ventralerne, samt et Stykke af Ryggens Sider op imod Skulderpartiets Sidetorne.

Hele Undersiden af saavel Legemet, som Halen, er fuldkommen glat.

Slimporer. Paa bestemte Steder af Oversiden, samt over den forreste Del af Legemets Underside findes Rækker af Slimporer, der idethele ere symmetrisk stillede paa hver Side af Legemets Midtlinie. Paa Oversiden findes en Række af omtr. 20 Porer, der strækker sig fra Spiracula hen under Øjet, og gaar derfra omtrent i ret Linie ud mod Snuden; denne Række løber parallelt med den tilsvarende paa den anden Side. Fra Skulderbeltet udgaa endvidere 2 noget længere Rækker, der efter et noget buet Løb udmunde noget nedenfor Pectoralens Sidevinkel; en kortere tredie løber parallelt med Legemets bagre afrundede Hjørne. Endelig løber paa hver Side af Ryglinien en Række, der fortsætter sig uafbrudt langs Halens Overside til Halespidsen.

Paa Skivens Underside findes talrige længere og kortere Rækker, men disse ere her tilsyneladende mindre ordnede. Paa hele Legemets bagre Del sees her ingen Porer; paa den forreste løber en lang Række parallelt med Siderranden; kortere Rækker løbe fra hver Mundvige hen mod Snudespidsen, og andre kortere Rækker findes bagenfor Mundspalten.

Farven er paa Oversiden temmelig jevnt mørkt graabrun, medens Undersiden er hvid med store symmetriske Pletter og Felter af Oversidens Farve. Paa Oversiden ere Pectoralerne og Ventralerne især mørkt farvede ud mod

of the lateral rows. The distance between the first and third spines in the central series nearly equals that between the first and third spines above the eyes; the distance between the central series and each of the lateral rows is somewhat greater.

The dorsal spines are 6 in number, arranged in a single row, the distance between each spine being about equal to that between the first and second spines in the series above the eyes (25mm), or between the first and second spines in the central humeral row. This series terminates in close proximity to the tail.

The caudal spines, numbering 17, extend in a single row; they are more closely set than the dorsal spines, increasing in size down to the sixth; at this point they gradually decrease, the terminal spine being quite diminutive and close to the first dorsal fin. The caudal row commences at some distance from the terminal dorsal spine. A small spine, the eighteenth, occurs between the two dorsals.

The whole of the upper surface is rough, being everywhere studded with minute spines and denticles, none of which attain to a size approaching that of the large spines. Part of the anterior lateral margin of the disk (almost directly in front of the eyes) is however furnished with spinules somewhat larger than the other denticles; a few spines of greater length occur too along the ridge of the snout. The only smooth parts are the posterior margin of the pectorals, the entire surface of the ventrals, and a strip of skin extending along the sides of the back up towards the lateral spines in the humeral region.

The whole of the under surface, both of the body and of the tail, is perfectly smooth.

Mucous pores. — On certain parts of the upper surface, and the anterior part of the lower, are numerous series of mucous pores, for the most part symmetrically arranged on either side of the mesial line. On the upper surface occurs a series of about 20 pores, extending from the spiracle to the eye, and from thence, nearly in a straight line, towards the snout; this series runs parallel to the corresponding series on the opposite side. Two series of somewhat greater length issue from the humeral zone, and, after a slightly inflected course, terminate a little below the lateral angle of the pectoral fin; a third and shorter series runs parallel to the posterior convex angle of the disk. On either side of the mesial line a series extends uninterruptedly to the tip of the tail.

Numerous series of greater or less extent occur too on the under surface, their arrangement, however, being apparently less regular. On the posterior part of the disk pores are nowhere visible here, on the anterior division a long row runs parallel to the lateral margin; several shorter series extend from each angle of the mouth towards the point of the snout, and short series also occur behind the mouth.

Coloration. — Upper surface almost uniformly dark greyish brown; under surface plain white, relieved with large symmetrical spots and patches. Upper surface of pectorals and ventrals darkest along the edges approximate

Randen, hvor Undersidens Felt af samme Farve støder til. Fremdeles er Snudespidsen mørkt brunsort, ligesom Hovedets hele forreste Rand. Paa Undersiden have de mørkfarvede Partier og den hvide Bundfarve omtrent ligestor Udstrækning. Disse farvede Felter gaa hen imod Randen af Legemet (hos det i nogen Tid paa Spiritus opbevarede Exemplar) over til næsten brunsort. Ingen af disse Felter overskrider Bugens Midtlinie.

Deres Udstrækning hos det forhaandenværende Individ kan kortelig beskrives paa følgende Maade. Et stort sort Felt udbreder sig over den ydre Del af Pectoralen; fra Pectoralvinkelen fortsætter dette sig langs hele den forreste Profilrand (men blot umiddelbart i selve Randen), lige hen til Snudespidsen. Bagtil forener dette Felt sig med et større Parti af samme Farve, der skyder sig op paa Bugens Sider. Foran Mundspalten findes intet farvet Parti (undtagen Randen af Snuden); men mellem Gjællespalterne findes en mindre Samling runde, tildels sammenflydende Pletter. Ventralerne have, ligesom Pectoralerne, brunsorte Rande; de accessoriske Generationsorganer ere ligeledes paa Undersiden sorte, hvilken Farve udbreder sig til en større Plet foran deres Rod. Hele Halens Underside er ensfarvet sort.

Sandsynligvis vil denne Farvefordeling vise sig noget varierende hos Individerne.

Føde. Ventrikelen var fuldproppet af Crustaceer og Fiske. Den væsentligste Del bestod af omkr. 50 kjæmpemæssige Individer af *Themisto libellula*, tildels endnu ganske hele; fremdeles Stykker af den i 1874 af Buchholz i „2te Deutsche Nordpolarfahrt" beskrevne smuktfarvede Decapode *Hymenodora glacialis*[1].

Fiskene vare 3 i Antal, hvoraf idetmindste de 2 vare Lycoder. Den største af dem havde en Totallængde af 185 mm, og en Hovedlængde af 41 mm; den yderste Halespids manglede, ligesom Huden og de fleste Finnestraaler, saaledes, at Individet ikke lod sig med Sikkerhed bestemme; men paa Grund af Tandbygningens Styrke, de lange og brede Pectoraler, samt det store Hoved, kan det maaske henføres under *L. lütkeni*. Den anden Unge af en *Lycodes* var stærkere angreben af Fordøjelsen, og ganske ubestemmelig; af et tredie Individ fandtes blot Rygraden i Behold, og denne kan ligeledes have tilhørt en ung *Lycodes*.

Udbredelse. Hidtil er blot kjendt det eneste, ovenfor beskrevne Individ, en Han, optaget omtrent under 80° N. B., i Havet vestenfor Nord-Spitsbergen; dette er tillige det nordligste Punkt paa Jorden, hvor denne Slægt hidtil har været bemærket.

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[1] *Pasiphaë glacialis*, Buchholz 1874; *Hymenodora glacialis*, G. O. Sars 1877.

to the similarly coloured patch on the under surface. Extremity of the snout, too, and the entire anterior margin of the head dark-brown, approaching to black. On the under surface, the space occupied by the dark portions of the skin and the white of the ground is about equal in extent. The dark symmetrical patches deepen in colour as they approach the margin of the disk, almost to a brownish black; none of them cross the central abdominal line.

Their distribution in the example obtained may be briefly described as follows. A large black patch occurs on the lateral margin of the pectorals; from the angle of the pectorals it extends along the anterior line of the margin of the body (at the extreme edge however only) to the tip of the snout. Behind, this patch unites with another, similarly coloured, running up the sides of the belly. Anterior to the cleft of the mouth the skin is uniformly white, save the margin of the snout; between the branchial apertures occur a small cluster of round spots, some of which are confluent. Edges of ventrals brownish black like those of pectorals; the accessory sexual appendages on the under surface black, this colour expanding to a large spot opposite their base. Under surface of tail entirely black.

This distribution of colour will probably be found to vary in different individuals.

Food. — The stomach was full of crustaceans and divers fishes. The principal part of the contents consisted of about 50 enormous examples of the Hyperoid *Themisto libellula*, several of them quite entire; and of fragments of the Decapod *Hymenodora glacialis*[1], described in 1874, by Buchholz, in "Zweite Deutsche Nordpolarfahrt."

The fishes were 3 in number, of which two at least were Lycodes. Total length of the largest 185 mm; length of head 41 mm; the tip of the tail, the whole of the skin, and most of the fin-rays were gone; hence this individual could not with certainty be determined; but the structure of the teeth however, the great length and breadth of the pectoral fins, and the size of the head gave reason to regard it as an example of *L. lütkeni*, afterwards described. Another young *Lycodes* was wholly indeterminable, being in still a more advanced stage of the digestive process; of the third, the vertebral column only remained — not improbably, too, that of a young *Lycodes*.

Distribution. — The only example hitherto met with is the male specimen now described, taken in lat. about 80° N., at sea, west of the northern coast of Spitzbergen, the most northerly locality, too, in which this genus is yet known to occur.

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[1] *Pasiphaë glacialis*, Buchholz 1874; *Hymenodora glacialis*, G. O. Sars 1877.

2. Raja radiata, Donov. 1808.

† *Raja fullonica*, Fabr. Fauna Groenl. No. 87, p. 125 (1780).
Raja radiata, Donov. Nat. Hist.-Brit. Fish., vol. 5, tab. 114 (1808).

Localit. fra Nordh.-Exp. Tanafjord i Finmarken, samt Havet mellem Beeren Eiland og Spitsbergen.

	Stat. 261.	Stat. 326.	Stat. 362.
Beliggenhed.	Tanafjord, Finmarken.	105 Kilom. N. Beeren Eiland.	115 Kil. V. Norskøerne, Sptb.
Dybde.	127 Favne (232m).	123 Favne (225m).	459 Favne (839m)
Temp. paa Bunden.	+ 2.8° C.	+ 1.6° C.	− 1.0° C.
Bunden.	Ler.	Mørkt Ler.	Blaagraat Ler.
Datum.	25de Juni 1878.	3die Aug. 1878.	14de Aug. 1878.
Antal Individer.	5 Indiv.	1 yngre Ind.	2 yngre Ind.

Alm. Bemærkninger. Ingen Forskjel kunde opdages mellem Individerne fra disse Localiteter, og andre fra Norges sydlige Fjorde. Antallet af de lange Torne nedad Ryggen fra Skulderpartiet til Dorsalerne varierede mellem 12 og 14.

Ved en tidligere Lejlighed[1] har jeg gjort opmærksom paa, at naar der i Diagnoserne for denne Art opgives, at den mangler Torn mellem de 2 Dorsaler, er dette unøjagtigt, idet et ikke ubetydeligt Antal Individer besidde en saadan, medens vistnok Flertallet mangler den. Blandt et stort Antal Individer, som jeg i 1876 og 1878 havde Lejlighed til at undersøge i Porsangerfjorden i Finmarken, havde idetmindste en Fjerdepart en saadan Torn mellem Dorsalerne. Af de under Nordhavs-Expeditionen erholdte 8 Individer fandtes denne Torn ogsaa netop hos de 2.

Føde. I Ventrikelen af et af Individerne fra Tanafjorden fandtes flere Amphipoder, hvoriblandt kunde nogenlunde sikkert kjendes Arterne *Anonyx lagena*, Kr., og *Aceros phyllonyx*, (M. Sars).

Udbredelse. *Raja radiata* har en større geographisk Udbredelse, end nogen anden af de europæiske Arter, og forekommer lige fra de engelske Kyster gjennem Nordsøen og Kattegat til den sydlige Del af Østersøen, fremdeles langs hele Norges Vestkyst op til Finmarken, i hvis Fjorde den er yderst talrig; derfra gaar den i Ishavet op til Spitsbergen, hvor den hidindtil ikke var iagttaget, men hvor den forekommer lige op til de nordligste Dele, ligesom den gjennem Faber er kjendt fra Island. Endelig opføres den og beskrives allerede af Fabricius i 1780 fra Grønland under Navn af *Raja fullonica* (Fauna Groenl. No. 87). Ved de amerikanske Kyster gaar den mod Syd idetmindste til New-England under 40° N. B.

[1] Forh. Vid. Selsk. Chra. 1879, No. 1, p. 105.

2. Raja radiata, Donov. 1808.

† *Raja fullonica*, Fabr. Fauna Groenl. No. 87, p. 125 (1780.)
Raja radiata, Donov. Nat. Hist. Brit. Fish., vol. 5, tab. 114 (1808).

Locality (North Atl. Exped.): — The Tana Fjord, in Finmark, and the sea between Beeren Eiland and Spitzbergen.

	Stat. 261.	Stat. 326.	Stat. 362.
Exact Locality.	The Tana Fjord, Finmark.	105 Kil. N. of Beeren Eiland.	115 Kil. W. of N. Isl., Spitzb.
Depth.	127 Fathoms (232m).	123 Fathoms (225m).	459 Fathoms (839m).
Temp. at Bottom.	+ 2.8° C.	+ 1.6° C.	− 1.0° C.
Bottom.	Clay.	Dark Clay.	Bluish-grey Clay.
Date.	25th June 1878.	3rd Aug. 1878.	18th Aug. 1878.
Numb. of Specim.	5 Indiv.	1 Indiv. (young).	2 Indiv. (young).

General Remarks. — No difference could be detected between the individuals taken in these localities and specimens obtained from the southern fjords of Norway. The number of long spines extending down the dorsal ridge was from 12 to 14.

On a former occasion[1] I called attention to the fact that, contrary to the diagnosis of this species given by some ichthyologists, a spine between the two dorsals *does* occur in a considerable number of individuals, though wanting in most. Opportunity was afforded me in 1876 and 1878 of examining numerous individuals from the Porsanger Fjord, in Finmark, and one-fourth had a spine between the dorsals. Of the 8 examples obtained on the North Atlantic Expedition, this spine occurred in 2.

Food. — In the stomach of one of the specimens from the Tana Fjord were divers Amphipods, amongst which *Anonyx lagena*, Kr., and *Aceros phyllonyx*, (M. Sars), could alone be determined with comparative certainty.

Distribution. — *Raja radiata* (Starry Ray) has a wider geographical range than any other of the European species; it is met with on the British coast, in the North Sea, the Cattegat, and the South-Baltic; along the entire line of the coast of Norway, as far north as Finmark, being exceedingly numerous in the fjords of that province; from thence its range extends to the Arctic Ocean as far north as Spitzbergen (where it had not previously been observed); according to Faber, it occurs, too, on the coast of Iceland; and the species was mentioned and described (as *Raja fullonica*) by Fabricius, as far back as 1780, among the fishes of Greenland. The range of this species on the North American coast certainly extends as far south as the New England States, in lat. 40° N.

[1] Forh. Vid. Selsk. Chra. 1879, No. 1, p. 105.

B. Teleostei.

Subord. Acanthopterygii.

Fam. Scorpaenidae.

Gen. Sebastes, Cuv.

Règne Animal, éd. 2, tom. 2, p. 166 (1829).

3. Sebastes mariñus, (Lin.) 1766.

Pl. I, Fig. 3—4.

Perca marina, Lin. Syst. Nat. éd. 12, tom. 1, p. 483 (1766).
Perca norvegica, Ascan. Ic. Rer. Nat. pt. 2, p. 7, tab. 16 (1772).
Holocentrus norvegicus, Lacép. Hist. Poiss., tom. 4, p. 327 (1789).
Holocentrus sanguineus, Faber, Naturg. Fische Isl. p. 126 (1829).
Sebastes norvegicus, Cuv. & Val. Hist. Nat. Poiss., tom. 4, p. 327 (1829).
Sebastes marinus, Lütk. Vid. Med. Naturh. Foren. Kbhvn. 1876, p. 358 (1876).

Localit. fra Nordh.-Exped. Yngel Indiv. fra Havet udenfor Beeren Eiland og Spitsbergen; Unger fra Tanafjorden i Finmarken, samt fra Havet mellem Beeren Eiland og Spitsbergen.

	Stat. 183.	*Stat.* 248.	*Stat.* 286.	*Stat.* 261.	*Stat.* 275.	*Stat.* 326.
Beliggenhed.	354 Kil. NV. Lofoten.	364 Kil. V. Lofoten	215 Kil. SV. Beeren Eil.	Tanafjorden, Finmarken.	360 Kil. Ø. Beeren Eil.	100 Kil. S. Spitsb.
Dybde.	I Overflad.	I Overflad.	I Overflad.	127 Favne (232 m).	147 Favne (269 m).	123 Favne (225 m).
Temp. p. Bunden.	+ 8.7° C.	+ 10.2° C.	+ 7.2° C.	+ 2.8° C.	− 0.4° C.	+ 1.6° C.
Bunden.				Ler.	Grønl. Ler	Mørkt Ler
Datum.	5te Juli 1877.	8de Juli 1877.	6te Juli 1878.	25de Juni 1878.	2den Juli 1878.	3die Aug. 1878.
Antal Individ.	4 Yngel-Ind.	1 Yngel-Ind.	18 Yngel-Ind.	2 Unger.	1 Unge.	2 Unger.

Forplantning etc. Paa flere Stationer erholdtes, saavel under 2det, som 3die Aars Togt, Yngel-Individer svømmende om i Vandskorpen midt ude paa Havet, og i en Afstand fra nærmeste Land, der kunde gaa op til henimod 400 Kilom. De erholdtes altid blot i det fine Overfladenet, blandede med forskjellige pelagiske Crustaceer og Molluskyngel, og dreve øjensynlig om med Strømmen fra den ene Del af Havet til den anden. Da de gjentagne Gange bleve trufne under de samme Forholde, og paa vidt adskilte Localiteter, kunne de ikke antages at være komne

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Holocentrus norvegicus, Lacép. Hist. Poiss., tom. 4, p. 390 (1789).
Holocentrus sanguineus, Faber, Naturg. Fische Isl. p. 126 (1829).
Sebastes norvegicus, Cuv. & Val. Hist. Nat. Poiss., tom. 4, p. 327 (1829).
Sebastes marinus, Lütk. Vid. Med. Naturh. Foren. Kbhvn. 1876, p. 358 (1876).

Locality (North Atl. Exped.): — The open sea, west of Beeren Eiland and Spitzbergen (fry); the Tana Fjord in Finmark; and the expanse of ocean stretching between Beeren Eiland and Spitzbergen (young examples).

	Stat. 183.	*Stat.* 248.	*Stat.* 286.	*Stat.* 261.	*Stat.* 275	*Stat.* 326.
Exact Locality.	354 Kil. N. W. Lofot.	364 Kil. W. Lofoten.	215 Kil. SW. Beeren Eil.	Tana Fj. Finmark.	360 Kil. E. Beeren Eiland.	100 Kil. S. Spitzb.
Depth.	Surface.	Surface.	Surface.	127 Fath. (232 m).	147 Fath. (269 m).	123 Fath. (225 m).
Temp. at Bottom.	+ 8.7° C.	+ 10.2° C.	+ 7.2° C.	+ 2.8° C.	− 0.4° C.	+ 1.6° C.
Bottom.				Clay.	Green Clay	Dark Clay.
Date.	5th July 1877.	8th Aug. 1877.	6th July 1878.	3rd Aug. 1878.	2nd July 1878.	3rd Aug. 1878.
Numb. of Specim.	4 Ind. (fry).	1 Ind. (fry).	18 Ind. (fry).	2 Indiv. (young).	1 Indiv. (young).	2 Indiv. (young).

Propagation of Species &c. — At several stations on the two last voyages fry-specimens were taken at the surface of the water in mid-ocean, some nearly 400 kilom. from land. They were invariably captured in the surface-net, together with divers pelagic crustaceans and fry of molluscs, and evidently drifted with the current from one part of the sea to the other. Having been repeatedly observed in localities widely distant under precisely similar circumstances, this peculiarity of occurrrence can hardly be explained as the result of accident alone,

tilfældigt under disse Omgivelser, men maaske tør man slutte, at denne Art, i Lighed med adskillige andre Dybvandsformer, tilbringer de første Perioder af sit Liv i de øvre Vandlag.

Ved en tidligere Lejlighed har jeg berørt[1], at *S. marinus* (ligesom *S. viviparus*) føder levende Unger, der i Gydningsøjeblikket befinde sig omtrent paa samme lidet udviklede Standpunkt, som det allerede gjennem Krøyer har været bekjendt hos den sidstnævnte, mindre Art[2]. Yngelens Totallængde i udstrakt Stilling hos *S. marinus* er i Gydningsøjeblikket omtrent 6mm; de ere dog strax istand til at svømme om, og føre et selvstændigt Liv.

Yngletiden falder ved de norske Kyster i Vaarmaanederne, i Regelen fra Midten af April til Midten af Maj, medens *S. viviparus* neppe normalt yngler før i Juli eller August. Dog erholdes ogsaa af *S. marinus* gydefærdige Exemplarer endnu langt ud paa Sommeren; under Gydningstiden findes Individerne sjeldnere paa ringere Dyb, end 100 Favne, men de fleste gyde sandsynligvis paa langt større Dybder. Naar den gydefærdige Fisk faaes op i Baaden, rinder ofte en Del af Yngelen ud af sig selv, og flere Fiskere have iagttaget, at den levende Yngel svømmer livligt om i Vandet i Bunden af Baaden; det samme kan man iagttage, om man opfanger den udrindende Yngel i et Øsekar.

Efter Gydningen maa saaledes Yngelen antages at søge op i de højere Vandlag, og først naar de have naaet en Længde af omkring 50—60mm, og faaet Farve og den voxne Fisks almindelige Udseende, søge de atter ned paa Dybet.

Antallet af Rogn hos et noget større Individ (550mm) anslaar jeg til mellem 100,000 og 150,000 St. (Til Sammenligning kan anføres, at jeg hos et Individ af *S. viviparus* med en Totall. af omtr. 300mm fandt blot omkr. 18—20,000 St.)

Hos de mindste af de under Expeditionen erholdte Individer (fra Stat. 183), hvis Totall. var 9.5mm, var hele Legemets Dorsal- og Ventralside endnu omhyllet af Embryonalhinden; Finnestraalerne vare alene i Caudalen tydelige, men manglede i de øvrige Finner; Ventralerne vare neppe antydede. De 2 parallele Kamme paa Baghovedet vare endnu ikke fremkomne, hvorimod Tænderne paa Præoperculum vare tydeligt afsatte.

Hos andre fra samme Station, hvis Totall. var 12mm, vare Straalerne antydede i Pectoralen, ligesom Analens Pigstraaler, medens Dorsalen endnu udgjør en sammenhængende Membran uden Straaler. Nakkekammen var nu ansat, og endte bagtil med en dobbelt Torn.

Hos det største Yngel-Individ (Stat. 248), hvis Totallængde var 19mm, vare alle Finner og deres Straaler

[1] Forh. Vid. Selsk. Chra. 1879, No. 1, p. 7.

[2] Nogen Distinction mellem de 2 Former kan saaledes ikke hentes fra dette Forhold, hvorfor Navnet *viviparus* ikke er synderligt betegnende.

and the species may, perhaps, in common with other deep-sea forms, pass the earliest stages of its existence in the upper strata of the sea.

On a former occasion[1] I alluded to the fact, that *S. marinus* as well as *S. viviparus* brings forth its young alive; they are produced however at the same low stage of development that Krøyer has already pointed out as characterising at birth those of the latter and smaller species.[2] Total length of the fry of *S. marinus* extended in a straight line at moment of birth about 6mm; they are, however, immediately able to swim and provide for themselves.

Off the Norwegian coast the spawning-season is in the spring months, and generally extends from the middle of April to the middle of May; *S. viviparus*, on the contrary, does not, as a rule, produce its young earlier than July or August. Examples of *S. marinus* with fully developed ova are, however, occasionally met with late in summer. During the season in which they bring forth, individuals are seldom taken at a depth less than 100 fathoms, the greater part probably produce their young in far greater depths. When a fish in that stage is taken, mature fry will frequently drop out; and fishermen have observed fry swimming friskly about in the water at the bottom of the boat, which they will continue to do if transferred to a scoop for examination.

It thus appears that the fry of this species rise towards the surface shortly, or perhaps immediately, after they are produced, choosing for their haunts the upper strata of the sea, and do not descend to any considerable depth till they have attained a length of about 50—60mm and are of the colour, form, and general appearance of the adult fish.

The number of ova in a large, full-grown individual (total length 550mm), may be computed at from 100,000 to 150,000 (in an example of *S. viviparus*, total length 300mm, I found only 18—20,000).

In the smallest specimens of the fry obtained on the Expedition (at station 183), total length 9.5mm, the whole of the dorsal and ventral margin was still enveloped in the embryonic membrane; the fin-rays were distinct in the caudal, but wanting in the other fins; of the ventrals there was hardly a rudiment; the two parallel combs on the occiput were not yet developed, but the teeth on the preoperculum were distinctly set.

In other examples, taken at the same station, total length 12mm, the rays of the pectorals and the spines of anal were still rudimentary; the dorsal in this stage of growth still constituted a membranous flap without a trace of rays; the comb on the nape was now partially developed, and terminated behind in a double spine.

The largest individual in the fry stage of growth (station 248), total length 19mm, had all the fins and their

[1] Forh. Vid. Selsk. Chra. 1879, No. 1, p. 7.

[2] This circumstance cannot therefore be regarded as a specific distinction between the two forms, and hence the term *viviparus* does not furnish a very appropriate designation.

ansatte, og med normalt Antal. Skjæl mangle endnu, og hele Legemet er transparent (paa Spiritus hvidagtigt) med en Række sorte Pigmentpuncter langs Dorsalerne. Enkelte Tænder ere fremkomne paa Underkjæven; Nakkekammen er temmelig skarp og tydelig, og ender bagtil i en tredobbelt Pig.

Foruden de nævnte Yngel-Individer erholdtes under Expeditionen flere Unger, der optoges med Bundskraben eller Trawlnettet fra 120 indtil 150 Favnes Dyb paa tildels iskoldt Vand.

Hos den mindste af disse Unger, hvis Totall. er 62^{mm} (Stat. 275), er Legemet allerede bleven livligt farvet med 3—4 brunsorte Tverpletter over Ryggen; tydeligst og bredest er den næstsidste, der stiger ned paa begge Sider af Dorsalens bløde Del; den sidste staar over Haleroden. Dette er den samme Fordeling af Pletter, der er gjennemgaaende hos de yngre Individer af de fleste cottoide Fiske. En Samling Pigmentpunkter danne en utydelig Plet paa Gjællelaagets øvre Del (en Character, der tilkommer de fuldt udvoxede Individer af den deciderede Kystform *Seb. viviparus*, Kr.), men denne Plet forsvinder efterhaanden hos de større Unger næsten ganske. Skjælbeklædningen var fuldt udviklet.

Disse Unger havde følgende Maal, og Straaleantal i Analen:

	Total-længde.	Hovedets Længde.	Øjets Diameter.	Straaler i A.
a.	62^{mm}	18^{mm}	6^{mm}	3.8.
b.	80 -	23 -	7.8 -	3.8.
c.	85 -	25 -	8 -	3.9.
d.	134 -	41 -	15 -	3.8.
e.	143 -	42 -	14 -	3.9.

Udbredelse. *S. marinus* er en nordisk Art, der har sit Tilhold ved Grønland, Island, Spitsbergen, Novaja Zemlja, samt ved Nord-Europas Kyster ned til Stavanger og Lindesnæs; paa den americanske Side gaar den sandsynligvis ned lige til New England, omtrent under 40° N. B. Som en ægte Dybvandsart synes den normalt ikke at trænge ind i Nordsøen, og er derfor blot sporadisk truffen ved Danmarks og Englands Kyster, og den gaar heller ikke ind i Kattegat og Østersøen.

Ved Norges Kyster østenfor Lindesnæs, og i de sydligste Fjorde, samt ved Bohuslen erstattes den af den meget nærstaaende Form *S. viviparus*, Kr., der tillige, ifølge Dr. Lütken, optræder ved Færøerne, men mangler ved Danmark. I Norge gaar denne op idetmindste til Trondhjemsfjorden.

I Nord-America synes Forholdet mellem de 2 Arter endnu ikke at være bragt fuldkommen paa det rene. Medens Gill (Proc. Ac. Nat. Sci. Philad. 1863, p. 333) opfører den ved New Englands Kyster forekommende Form som *S. viviparus*, ganske med Udelukkelse

rays developed, and the number of the latter normal. The scales were as yet wanting; the body was everywhere transparent (preserved in spirits whitish), dotted along the dorsals with a series of black pigmentary points; a few teeth developed in the lower jaw; the comb on the nape was sharply defined, terminating behind in a trifurcate spike.

Exclusive of the individuals described above, in the fry stage of growth, several young specimens were obtained on the Expedition; they were taken when dredging the bottom or trawling, at a depth varying from 120 to 150 fathoms, the water having in places the temperature of ice.

In the smallest of these young examples (station 275), total length 62^{mm}, the body was already brightly coloured with 3—4 brownish-black transverse spots in the dorsal region; the broadest and most distinct is the last but one, which descends down along the soft portion of the dorsal; the terminal spot is immediately above the origin of the tail. This is the common distribution of spots in young examples of most Cottoid fishes. A cluster of pigmentary points gives the appearance of an indistinct spot on the upper portion of the operculum (a characteristic peculiar to full-grown individuals of the coastal form *Seb. viviparus*, Kr.); but this spot gradually disappears with the growth of the fish, leaving hardly a vestige in adult examples. The scales were fully developed.

Measurements of the young specimens, with number of rays in anal: —

	Total Length.	Length of Head.	Diam. of Eye.	Numb. of Rays in A.
a.	62^{mm}	18^{mm}	6^{mm}	3.8.
b.	80 -	23 -	7.8 -	3.8.
c.	85 -	25 -	8 -	3.9.
d.	134 -	41 -	15 -	3.8.
e.	143 -	42 -	14 -	3.9.

Distribution. — *S. marinus* is a northern species; it occurs off the coasts of Greenland, Iceland, Spitzbergen, Nova Zemlja, and the shores of northern Europe, at least as far south as Stavanger and the Naze; in the western hemisphere its range probably extends along the coast of North America, as far south as the New England States, in lat. about 40° N. As a true deep-sea species, it can hardly pass the North Sea; hence it occurs, sporadically, off the coasts of Denmark and Great Britain, and does not frequent the waters of the Cattegat or the Baltic.

On the coast of Norway, east of the Naze, and in the most southern of the fjords, as well as off Bohuslen, this species is replaced by the closely allied *S. viviparus*, Kr., which, according to Dr. Lütken, also occurs off the Faröe Islands; but it is not met with on the coast of Denmark. In Norway it certainly extends as far north as the Trondhjem Fjord.

The distribution of the two species in North America does not appear to have been fully ascertained. Gill (Proc. Ac. Nat. Sci. Philad. 1863, p. 333) describes the form occurring on the coast of New England as *S. viviparus*, and does not even mention *S. marinus*; on the other hand.

af *S. marinus,* opgiver Bean og Goode i sin nyeste Catalog over samme Districts Fiske (Bull. Ess. Inst. vol. 9, 1879), at de af dem undersøgte Individer „correspond most nearly with *S. marinus*".

Fam. Cottidae.

Gen. Cottunculus, Coll.

Norges Fiske, Tillægsh. til Forh. Vid. Selsk. Chra. 1874, p. 20. Chra. 1875 (1874).

Hovedet bredt ægformigt, forholdsvis stort og højt; Legemet kort og tyndt, beklædt med chagrinartede Bentornegrupper, men uden Skjæl. Gjællelaagene uvæbnede, men med stumpe Knuder. Tænder i Kjæverne og paa Vomer. Sidelinie tilstede. Dorsalerne fuldstændigt sammenvoxede. Gjællehinderne ere ikke indbyrdes sammenhængende paa Hovedets Underside.

4. Cottunculus microps, Coll. 1874.

Pl. I, fig. 5—6.

Cottunculus microps, Coll. „Norges Fiske", Tillægsh. til Forh. Vid. Selsk. Chra. 1874, p. 20, Pl. 1, Fig. 1—3 (1874).

Diagn. *Hovedet, Legemet og Finnerne tæt chagrinerede. Hovedets Længde indeholdes $2^3/_4$ Gange i Totallængden. Øjnene forholdsvis smaa, med stor Lindse; Interorbitalrummet særdeles bredt. Praeoperculum har 4 stumpe Knuder, men ingen Torne; Operculum er helrandet. Paa Panden 2 Par Tuberkler, der danne et Qvadrat. Gjællespalten vid. Sidelinien uvæbnet, har omtr. 10 Porer. Straalerne i Dorsalens forreste Del (Pigstraalerne) særdeles lave, spinkle og svage, næsten 3 Gange kortere, end de bagre Straaler. Pectoralerne brede og lange, naa tilbage forbi Begyndelsen af Analen. Ventralerne korte og spinkle, med stort Mellemrum; Analen er uden Pigstraaler. Anus ligger midt mellem Snudespidsen og sidste Halehvirvel. Farven hvidagtig med 4 brunsorte Tverbaand, hvoraf det forreste gaar tvers over Snuden. Appendices pyloricae 2. Størrelsen indtil 175*^{mm}.

M. B. 6; D. 6/13—6/15; *A. 10; P. 15—19; V. 3; C.* 4/12/4.

Localit. fra Nordh. Exped. Havet sønden- og vestenfor Spitsbergen.

Bean and Goode, in their latest catalogue of the fishes of that region (Bull. Ess. Inst. vol. 9, 1879), state that all individuals examined by them "correspond most nearly with *S. marinus.*"

Fam. Cottidæ.

Gen. Cottunculus, Coll.

"Norges Fiske," Appendix to Forh. Vid. Selsk. Chra. 1874, p. 20 Chra. 1875 (1874).

Head broad, ovate, size and height considerable; body short and thin, covered with clusters of rough granulations; scales wanting; gill-covers with obtuse knotty protuberances, but not armed; teeth in maxillaries and on vomer; lateral line obvious; dorsals continuous, forming a single fin; branchial membrane disconnected on the inferior surface of the head.

4. Cottunculus microps, Coll. 1874.

Pl. I. fig. 5—6.

Cottunculus microps, Coll. "Norges Fiske," App. to Forh. Vid. Selsk. Chra. 1874, p. 20, Pl. 1, Fig. 1—3 (1874).

Diagnosis. — *Head, body, and fins thickly covered with rough granulations; length of head to total length as 1 to $2^3/_4$; eyes comparatively small, with the lenses large; interorbital space exceedingly wide; four obtuse knotty protuberances on the preoperculum, but no spines; margin of operculum entire; two pairs of tubercles on the crown, arranged quadrangularly; gill-openings wide; lateral line smooth, with about 10 pores; the anterior rays of the dorsal (the spiny portion) exceedingly short, slender, and feeble, the rays in the soft portion almost 3 times longer; pectorals broad and long, extending backwards beyond the origin of the anal; ventrals short and slender, far apart; anal without spiny rays. Vent midway between tip of snout and the last caudal vertebra. Colour whitish, with 4 brownish-black bands, the first of which traverses the snout; pyloric appendages 2. Length reaching 175*^{mm}.

M. B. 6; D. 6/13 *or* 6/15; *A. 10; P. 15—19; V. 3; C.* 4/12/4.

Locality (North Atl. Exped.): — The open sea, south and west of Spitzbergen.

	Stat. 290.	Stat. 362.	Stat. 363.
Beliggenhed.	216 Kil. N.V. Hammerfest.	115 Kil. V. Norsk-øerne, Spitsb.	60 Kil. V. Norsk-øerne, Spitsb.
Dybde.	191 Favne (349m).	459 Favne (839m).	260 Favne (475m).
Temp. paa Bunden.	+ 3,5° C.	— 1.0° C.	+ 1.1° C.
Bunden.	Sandholdigt Ler.	Blaagraat Ler.	Blaaler.
Datum.	7de Juli 1878.	14de Aug. 1878.	14de Aug. 1878.
Antal Indiv.	1 yngre Indiv.	1 Indiv.	1 Indiv.

Bemærkninger til Synonymien. Slægten *Cottunculus* er ikke nær beslægtet med nogen af de øvrige arctiske Cottoider. Dens enkelte (sammenvoxede) Dorsal, og de uvæbnede Gjællelaag skiller den vidt fra disse; men Bygningen af Ventraler og Pectoraler, Tandforholdene og Legemets almindelige Habitus er saa overensstemmende med det characteristiske for denne Familie, at den neppe kan udsondres herfra.

Hidtil er blot en enkelt Art kjendt, der opstilledes i 1874 i „Norges Fiske" efter en 15mm lang Unge, optagen paa 200 Favnes Dyb ved Hammerfest i Vestfinmarken i Aug. s. A. Da den oprindelige Beskrivelse maatte affattes efter dette eneste og diminutive Specimen, er det en Selvfølge, at den i flere Puncter maatte blive ufuldstændig, hvad jeg ogsaa har udtalt paa det ovenciterede Sted. Det har derfor været af særdeles Interesse at faa Lejlighed til at undersøge af denne i flere Henseender mærkelige Form 3 større Individer, hvoraf det ene sandsynligvis er fuldvoxent eller nær derved; og skjønt den oprindelige Beskrivelse af det nys udklækkede Individ endnu i alle væsentlige Dele passer paa de udvoxede, meddeles dog her en ny, hvorved især Slægts- og Artsdiagnosen bedre har kunnet fixeres. Allerede Figurerne paa ovennævnte Sted gjengive ganske kjendeligt ogsaa de udvoxede Individer, om de end i flere Punkter have kunnet corrigeres, som det vil sees af de i nærværende Skrift meddelte Figurer.

Udmaalinger.

	a. (St. 290).	b. (St. 362).	c. (St. 363).
Totallængde	93mm	136mm	175mm
Længde uden Caudalen	73 -	103 -	145 -
Længde fra Snudespidsen t. Dorsalen	34 -	45 -	65 -
Længde fra Snudespidsen til Anus	37 -	51 -	69 -
Længde fra Snudespidsen til Analen	45 -	65 -	88 -
Længde fra Anus til Analen	8,5 -	14 -	19 -
Længde fra Anus til sidste Halehvirvel	35 -	57 -	73 -
Hovedets Længde	33 -	48 -	65 -
Hovedets Bredde	28 -	41 -	58 -
Legem. største Højde over Nakken	25 -	31 -	46 -
Legem. Højde over Beg. af Analen	12 -	16 -	25 -
Gjællespaltens Højde	19 -	28 -	38 -
Længde fra Snudespidsen t. Lindsen	11 -	14 -	21 -

	Stat. 290.	Stat. 326.	Stat. 363.
Exact Locality.	216 Kil. NW. of Hammerfest.	115 Kil. W. of Norsk Islands.	60 Kil. W. of Norsk Islands.
Depth.	191 Fathoms (349m).	459 Fathoms (839m).	260 Fathoms (475m.)
Temp. at Bottom.	+ 3.5° C.	— 1.0° C.	+ 1.1° C.
Bottom.	Sabulous Clay.	Bluish-grey Clay	Blue Clay.
Date.	7th July 1878	14th Aug. 1878	14th Aug. 1878
Number of Specim.	1 Indiv. (young).	1 Indiv.	1 Indiv.

Remarks on the Synonymy. — The genus *Cottunculus* is not closely related to any of the Arctic Cottoids. The dorsals, occurring continuous as a single fin, together with the unarmed opercles, widely distinguish it from the other genera; but, on the other hand, the structure of the ventral and pectoral fins, the teeth, and the general structure of the body correspond so closely with the salient characteristics of the latter family, that we can hardly venture to exclude it from the *Cottidæ*.

Up to the present time one species only has been met with, which was described in 1874, in "Norges Fiske," the specimen being a young fry-individual, 15mm in length, taken at a depth of 200 fathoms, off Hammerfest, West Finmark, in August that year. The only specimen examined having been a diminutive example, it naturally follows that the description itself, to a certain extent, was defective, which I took occasion to point out in the paper cited above. Such being the case, I eagerly availed myself of an opportunity to examine three larger specimens of this, in many respects, remarkable form, one of which, probably, was a full-grown adult or, at least, not far short of maturity. The original description of the very young specimen does not materially differ from the new diagnosis here given, in which the generic and specific characters are, however, set forth with greater precision. As will be seen, the figures in the paper mentioned above closely resemble those of the adult fish given in the present work.

Measurements.

	a. (St. 290.)	b. (St. 362.)	c. (St. 363.)
Total length	93mm	136mm	175mm
Length, exclusive of caudal	73 -	103 -	145 -
Length, from tip of snout to dorsal	34 -	45 -	65 -
Length, from tip of snout to vent	37 -	51 -	69 -
Length, from tip of snout to anal	45 -	65 -	88 -
Length, from vent to anal	8.5 -	14 -	19 -
Length, from vent to last caudal vertebra	35 -	57 -	73 -
Length of head	33 -	48 -	65 -
Breadth of head	28 -	41 -	58 -
Greatest height of body (at the nape)	25 -	31 -	46 -
Height of body above origin of anal	12 -	16 -	25 -
Height of gill-opening	19 -	28 -	38 -
Length, from tip of snout to lens	11 -	14 -	21 -

Lindsens Længde	4 mm	5 mm	5 mm
Længden fra Lindsen til Gjællespalten	20 -	29 -	39 -
Afstanden mellem Lindserne	9 -	13 -	16 -
Overkjævens Længde	13 -	22 -	25 -
Underkjævens Længde	15 -	23 -	28 -
Højden af Dorsalens første Afdeling (Pigstraalerne)	3,5 -	5 -	6 -
Højden af Dorsalens anden Afdeling (den bløde Del)	8,6 -	12 -	14,5 -
Længste Dorsalstraale	12 -	20 -	29 -
Dorsalens Grundlinie	40 -	58 -	70 -
Højden af Analen	6 -	9 -	11 -
Længste Analstraale	10 -	16 -	21 -
Analens Grundlinie	22 -	27 -	37 -
Pectoralens Længde fra dens nedre Rand	27 -	44 -	60 -
Pectoralens Længde fra dens øvre Rand	14 -	29 -	36 -
Ventralens Længde	8 -	15 -	15 -
Ventralernes indbyrdes Afstand	6 -	6 -	9 -
Caudalens Længde	20 -	31 -	32 -
Halerodens Højde	5,5 -	6 -	10 -

Beskrivelse. *Legemsbygning.* Det egentlige Legeme er forholdsvis kort og svagt, medens Hovedet er uforholdsmæssigt stort. Den største Højde falder lige over Nakken, og indeholdes omtr. 3 Gange i Legemets Længde indtil Haleroden. Bagenfor Nakken, aftager Højden hurtigt, og har ved Haleroden, der er kun lidt over en Hovedlængde fjernet fra Hovedet, omtrent Højden af en Øjendiameter. Samtidig bliver Legemet stærkt sammentrykt fra Siderne; især er Halepartiet temmelig skarpt afsat fra Kroppen, og dets Tykkelse allerede ved Anus betydeligt mindre, end dets Højde. Legemets nedre Profillinie er næsten ret, kun ubetydeligt indkneben bagenfor Anus; den øvre er stærkt nedstigende fra Nakken af, og tildels noget concav. Anus ligger langt foran Analen, næsten ligesaa langt fra denne Finne, som fra Ventralernes Fæste, eller næsten midt mellem Snudespidsen og den sidste Halehvirvel; hos den nyklækkede Yngel (fra Hammerfest) ubetydeligt nærmere den sidste. Analpille er ikke tilstede hos noget af de undersøgte Individer, hvoraf idetmindste det ene var en Han. 2 *Appendices pyloricae* ere tilstede.

Hovedet er særdeles stort, og seet ovenfra bredt ægformigt; dets Længde indeholdes i Totallængden blot $2^3/_4$ Gange, og dets største Bredde er næsten lig dets Længde.

Gjællelaagene ere uvæbnede, og dækkede af en fælles, tyk Hud, ligesom Gjællespaltens indre Beklædning er særdeles blød og tyk. Praeoperculum har ingen fri Torne, men Huden dækker paa dets nedre Rand 4 stumpe Knuder, der hæve sig kun ubetydeligt, og som svare til de paa dette Sted optrædende Torne eller Pigge hos de fleste øvrige cottoide Fiske. Mellem disse stumpe Knuder danner Huden rundagtige Fordybninger, der ere fuldstændig lukkede i Bunden.

Longitudinal diameter of lens	4 mm	5 mm	5 mm
Distance from lens to branchial aperture	20 -	29 -	39 -
Distance between lenses	9 -	13 -	16 -
Length of upper maxillary	13 -	22 -	25 -
Length of lower maxillary	15 -	23 -	28 -
Height of first division of dorsal (spiny part)	3.5 -	5 -	6 -
Height of second division of dorsal (soft part)	8.6 -	52 -	14.5 -
Longest ray of dorsal	12 -	20 -	29 -
Base of dorsal	40 -	58 -	70 -
Height of anal	6 -	9 -	11 -
Longest ray of anal	10 -	16 -	21 -
Base of anal	22 -	27 -	37 -
Length of pectorals from lower margin	27 -	44 -	60 -
Length of pectorals from upper margin	14 -	29 -	36 -
Length of ventrals	8 -	15 -	15 -
Distance between ventrals	6 -	6 -	9 -
Length of caudal	20 -	31 -	32 -
Height of tail at base	5.5 -	6 -	10 -

General description. *Structure of the Body.* — The body proper comparatively short and slender, head disproportionately large. The greatest height is across the nape, being contained 3 times in the length of the body to the origin of the caudal. Posterior to the nape, the height rapidly decreases, being at the base of the tail, which is distant from the head but little more than its length, about equal to the diameter of the eye. At the nape, too, the body becomes much depressed; the tail in particular is narrow and thin, projecting distinctly from the body; its thickness even at the vent is considerably less than its height. Ventral line almost straight, but slightly deflected posterior to the vent; dorsal line rapidly descending, and somewhat concave. Vent considerably in advance of the anal, being distant from that fin almost as far as from the base of the ventrals, or nearly mid-way between the point of the snout and the terminal vertebra; in the very young specimen (taken off Hammerfest), a trifle nearer the latter. Anal papilla wanting in the individuals examined, one of which at least was a male. Pyloric appendages two.

Head unusually large, and seen from above broadly ovate; its length is contained $2^3/_4$ times in the total length, and its greatest breath is nearly equal to its length.

The opercles are unarmed, and protected by a thick continuous membrane; the inner integument of the gill-openings, too, is exceedingly soft and thick. Preoperculum without true spines; under the skin however, along the margin, occur four knotty protuberances, but slightly prominent, corresponding with the osseous spines or spikes on that part of the cranium in most of the other Cottoid fishes. Between these obtuse tubercles, the skin exhibits circular depressions, which are completely closed at the bottom.

Over Bagranden af Øjnene staa paa hver Side et Par kegleformige Knuder, der lige til Spidsen ere klædte af Hovedhuden; af disse er den ydre den mindste (hos det mindre Ex. fra Stat. 362 er den næsten umærkelig). I omtrent en Orbitaldiameters Afstand bagenfor disse staa paa hver Side en enkelt Knude, der er af Højde og Form som den største af de forreste. Tilsammen danne disse 4 største Knuder et Qvadrat, hvis Bredde indeholdes omtr. $1^1/_2$ Gang i deres Længde, og de repræsentere selvfølgelig den samme Anordning af Pandeknuderne, som hos de fleste øvrige Arter af denne Familie. Endelig findes et Par stumpere Knuder paa hver Side af Hovedet i den Linie, der strækker sig mellem Øjets og Gjællespaltens øvre Rand.

Øjnene ere forholdsvis smaa, men have stor Lindse; dog er Øjets ydre Begrændsning vanskelig at drage, da Overhuden er beklædt med de samme spidse Bentorne, som ere strøede ud over hele Hovedet, lige ind mod Lindsen. Navnet *microps* er derfor kun forsaavidt betegnende, som næsten hele Iris er skjult under denne farvede og ru Overhud. Dog maa Orbitas Længde antages at indeholdes over 5 Gange i Hovedets Længde; Afstanden fra Lindse til Lindse indeholdes omtrent $3^1/_2$ Gange i Hovedlængden, og Interorbitalrummet bliver paa Grund heraf temmelig bredt.

Munden er bred og vid, og Mundspalten gaar tilbage til under Midten af Lindsen. Underkjæven rager ganske ubetydeligt frem foran Overkjæven.

Næseborene ere 2 Par, hvoraf de nederste ere rørformigt forlængede. Overkjævens Rand, det forreste Næsebor, det bagerste Næsebor, og Øjet, ligge fjernede i en indbyrdes Afstand fra hinanden af omtr. en Lindsediameter. Tungen er særdeles bred og tyk, og fortil fri.

Gjællehinderne have 6 Straaler; de ere ikke sammenvoxede paa Hovedets Underside, saaledes at de danne en tvers over denne løbende fri Fold, saaledes som hos alle de øvrige Slægter af vore cottoide Fiske (*Cottus, Phobetor, Centridermichthys, Icelus, Triglops*, etc.), men ophører ved den nedre Ende af hver Gjællespalte. Den indbyrdes Afstand mellem Gjællespalterne paa Hovedets Underside er omtrent lig Hovedets postorbitale Del, saaledes forholdsvis betydelig.

Gjællespalten er forholdsvis vid og strækker sig fra Pectoralens nedre Fæste op til ovenfor Legemets Midtlinie. Operculum er særdeles stort og bredt, og dækker et ikke ubetydeligt Parti af Legemet mellem Gjællespalten og Pectoralen; den øvre fri Rand af Operculum danner derfor en næsten ret Linie af Længde som en Øjendiameter. Gjællerne ere af normal Bygning.

Tænderne ere tilstede i Kjæverne og paa Vomer, men mangle paa Palatinbenene. I Over- og Underkjæven danne de flere Rækker; paa Vomer sidde de i 2, neppe sammenhængende Felter.

Finnerne. Straaleantallet i de forskjellige Finner viste sig at være følgende:

	a.	b.	c.
Dorsalen	20 (6 + 14);	21 (6 + 15);	20 (6 + 14).

Above the posterior margin of the eyes, on either side, occur a couple of cuneiform protuberances or tubercles, enveloped up to the point in the skin of the head; the exterior is the smaller of the two, (in the small example from Station 362 scarcely obvious). Posterior to these tubercles, on either side, distant about the length of the orbital diameter, is an isolated tuberbcle, the same in shape and size as the larger of the two anterior ones. The four largest tubercles form a quadrangle, the breadth being to the length as 1 to $1^1/_2$; hence the disposition of these protuberances is precisely the same as in most of the other species of *Cottidæ*. On either side of the head 2 tubercles, somewhat more obtuse, occur along the line extending between the eye and the upper margin of the gill-opening.

Eyes comparatively small, but with large lenses; the exterior limit of the eye, however, is difficult to determine, the cuticle being studded, nearly to the edge of the lens, with sharp osseous prickles, similar to those dispersed over the entire surface of the head. Hence the name *microps* is not otherwise appropriate than from the circumstance of the iris being almost entirely hidden beneath the rough and coloured cuticle. The diameter of the orbit cannot, however, be much less than one-fifth of the length of the head; the distance between the lenses is to the length of the head as 1 to $3^1/_2$: interorbital space consequently broad.

Mouth wide, the maxillary extending to the middle of the eye. The lower jaw slightly projecting beyond the upper.

Nostrils double, each of the lower tubular. Distance between the margin of upper jaw, the anterior nostril, the posterior nostril, and the eye in each case about equal to the diameter of the lens. Tongue exceedingly broad and thick, the forepart detached.

Brancheostegous rays 6; the gill membrane not continuous across the isthmus and connecting the gill-openings by a detached cutaneous flap, as is the case in almost all the other genera of our Cottoid fishes (*Cottus, Phobetor, Centridermichthys, Icelus, Triglops*, etc.), but attached to the isthmus, and terminating at the lower extremity of each opening. Distance between the lower margin of the gill-openings about equal to the length of the postorbital region of the head, and hence comparatively great.

The gill-openings are comparatively wide, extending from the base of the pectorals to some distance above the mesian line of the body. Operculum very large and broad, covering a considerable portion of the body between the gill-openings and the pectorals; upper free margin of operculum, in length about equal to the diameter of the eye, consequently almost straight. Structure of gills normal.

Teeth in jaws and on vomer, wanting on the palatine bones. Along the maxillaries they are regularly disposed in several well-defined series; on the vomer, the arrangement is in two quadrangular divisions, probably continuous.

Fins. — The fin-ray formula in the 3 specimens was as follows: —

	a.	b.	c.
Dorsal	20 (6 + 14);	21 (6 + 15);	20 (6 + 14).

Analen	10;	10;	10.
Caudalen	12;	12;	12.
Pectoralerne . . .	17—18;	19—19;	18—19.

Dorsalerne ere fuldstændigt sammenvoxede til en enkelt, der udspringer allerede over den bagre Flig af Gjællelaaget, og løber ned til omtrent i en Lindsediameters Afstand fra Haleroden. Dens forreste Del, der svarer til 1ste Dorsal, og som tæller 6 Straaler, er særdeles lav, og neppe over en Lindsediameter hævet over Legemet; Straalerne ere her Pigstraaler, men yderst svage og spinkle. Dorsalens bagre Del, der svarer til 2den Dorsal, er temmelig skarpt afsat fra den første ved sine længere Straaler, der dog ere skraat bagudrettede, saaledes, at de aldrig kunne rejse sig til sin fulde Højde. Antallet er her 14—15; de ere leddede og kløvede, og deres største Længde er omtr. lig Afstanden fra Snudespidsen til Øjets bagre Rand. Begge Partier ere fuldstændigt sammenvoxede, uden større Mellemrum, end mellem de øvrige Straaler, og den forbindende Membran er ligesaa høj, som Finnens forreste Del. Straalerne, hvis samlede Antal saaledes er 20—21, ere indhyllede i den fælles, tykke, med smaa Bentorne bedækkede Hud, der beklæder Legemet; især er dette Tilfældet med Pigstraalerne, hvis Antal og Bygning blot ved Dissection kan undersøges.

Analen er forholdsvis kort, udspringer et betydeligt Stykke bagenfor Anus, og har 10 Straaler, der alle ere leddede, og hvoraf de første ere særdeles spinkle. Disse Straalers Længde naar ikke Længden af de tilsvarende Straaler i Dorsalen; ligesom i denne ere de rettede skraat bagover. Analen ophører i noget større Afstand fra Haleroden, end Dorsalen (Afstanden er næsten 2 Lindsediametre); dens Grundlinie svarer omtrent til Længden af Hovedets postorbitale Del.

Pectoralerne ere i Forhold til det spinkle og korte Legeme forholdsvis lange og brede; de begynde paa Hovedets Underside lidt nedenfor Gjællespaltens nedre Ende, og have en Grundlinie, der omtrent er saa stor, som Snudens Afstand fra Bagranden af Lindsen. Straalernes Antal er 17—19, hvoraf den nederste er temmelig kort. Alle have noget fri Spidser; hos de 4—5 nederste ere disse Spidser temmelig lange. Alle Pectoralstraaler ere leddede, men ikke kløvede mod Spidsen. Finnens Længde, regnet fra dens nederste Rand, indeholdes 3—3½ Gange i Totallængden; Spidsen naar tilbage til den 3die Straale i Analen, og med næsten Finnens halve Længde forbi Anus.

Ventralerne have 3 Straaler, hvoraf den indre er længst. De ere smale og spinkle, samt temmelig korte, og alle i Spidserne fri. Deres Længde hos de undersøgte Individer er omtrent lig Afstanden mellem de forreste Næsebor; tilbageslaaede ere de en halv Finnelængde fjernede fra Anus. De ere skilte ved et forholdsvis betydeligt Mellemrum, der er omtr. ligt ⅔ af Finnernes egen Længde.

Caudalen er af middels Længde, eller noget derover; den er stumpt afrundet, og har 12 Straaler, der mod Spidsen ere spaltede i 2 tætsluttende Grene.

Anal	10;	10;	10.
Caudal	12;	12;	12.
Pectorals	17—18;	19—19;	18—19.

Dorsals continuous, forming a single fin, which commences immediately above the posterior lappet of the gill-cover, terminating in close proximity to the root of the tail, from which it is distant about the length of the diameter of the lens. The anterior division, answering to the first dorsal, and furnished with 6 rays, is much depressed, the greatest height being not more than the length of the lens; here the rays are spiny, but exceedingly slender and feeble. The posterior division, answering to the second dorsal, rather abruptly connected with the anterior part, from the greater length of the rays, which, however, incline backwards, and do not admit of being raised to their full height; they are cleft and articulated, the length of the longest being about equal to the distance from the point of the snout to the posterior margin of the eye; number 14—15. The space between the two divisions, which are continuous, not greater than that between the rays, the connecting membrane being on a level with the anterior part of the fin. The rays (total number 20—21) are enveloped in the thick skin — studded with minute granulations — that covers the body; this is more particularly the case with the spiny portion, for the examination of which dissection is necessary.

Anal comparatively short, commencing at a considerable distance from the vent; it is furnished with 10 rays, all of them articulated, those on the anterior part extremely slender. Length of anal rays less than that of the corresponding rays in the dorsal; like the latter, they incline backwards. The anal terminates at a somewhat greater distance from the root of the tail than the dorsal (about twice the diameter of the lens); basal line nearly equal to the length of the postorbital region of the head.

Pectorals long and broad as compared with the short and slender body; they commence on the under surface of the head, a little below the inferior extremity of the branchial opening; basal line about equal to the distance from the snout to the posterior edge of the lens. Number of rays 17—19, the undermost rather short; all the points detached, and rather long in 4 or 5 of the undermost. All the rays articulated, but not cleft towards the points. The length of the fin, measured from the inferior margin, is to the total length as 1 to 3—3½; the point extends backwards to the third ray of the anal, and nearly half the length of the fin beyond the vent.

Ventrals furnished with 3 rays, the innermost of which is the longest; they are narrow and slender, rather short, with all the points detached; length in the specimens examined about equal to the distance between the anterior nostrils; their points are half the length of the fin from the vent. Space between these fins considerable, being about two-thirds of the whole length of the fin.

Caudal of moderate length, obtusely convex; it is furnished with 12 rays, cleft towards the points into two close branches.

Hos et noget mindre Individ, hvis Totallængde var 50 mm, og som var optaget Høsten 1878 fra 180 Favnes Dyb ved Rissen i Trondhjemsfjorden af Conserv. Storm, og som blev mig tilsendt til Undersøgelse, var Straaleantallet følgende: D. 19 (6 + 13); A. 10; P. 15—17; C. 12. Individet, som opbevares i Videnskabernes Selskabs Samling i Trondhjem, svarede iøvrigt ganske til de øvrige Individer (med Undtagelse af den ringe Afvigelse i Straaleantallet), og er nærmere omtalt i Forh. Vid. Selsk. Chra. 1879, No. 1, p. 11.

Sidelinie. Denne, der var usynlig hos det 15 mm lange Typ-Exemplar, er tilstede hos de større, og fremhæver sig som en ophøjet Stribe mellem Hudens tætte Beklædning af Bentorne. Porerne, der blot er 10 i Antal, ere dog saa smaa, at de kun med nogen Vanskelighed lade sig forfølge i deres hele Række. Sidelinien udspringer ved Gjællelaagets øvre Ende, stiger strax i skraa Retning ned mod Legemets Midtlinie, som den naar noget bagenfor Analens Begyndelse, og løber derfra uden yderligere Sænkning ud til Caudalen.

Langs Roden af Underkjæven strækker sig paa hver Side en Række af 3 dybe Porer; en lignende Række løber langs Overranden af Overkjæven, ligesom enkelte Porer findes langs den nedre Rand af Praeoperculum. Skjægtraade paa Kjæverne mangle.

Hudens Beklædning. Huden er næsten overalt tæt beklædt med Smaagrupper af yderst fine Bentorne, der især paa Legemets Overside sidde saa tæt, at de næsten ikke lade nogen glat Del af Huden tilsyne. Hver Gruppe har her en rundagtig Omkreds, og er sammensat af omtr. 10 Bentorne, der ere yderst lave, saa at Huden blot faar en ru Overflade. Lige saa tætte og af samme Omfang ere Tornegrupperne paa Gjællelaagene, medens de paa den øvrige Del af Hovedets Overside have mindre Omkreds, og staa mere spredte. Ligeledes ere de noget mindre paa Legemet nedenfor Sidelinien.

Paa det egentlige Bugparti mangle disse Bentornegrupper næsten ganske hos det største Individ (*c*), saavelsom paa hele Hovedets Underside; hos det næststørste Individ (*b*, Totall. 136 mm) vare de langt færre og mindre paa Bugsiden, og manglede ganske paa Hovedets Underside; derimod vare Grupperne hos det mindste af de nyerholdte Individer (*a*, Totall. 93 mm) tilstede overalt paa disse Legemsdele lige hen til Underkjævespidsen, og lige saa tæt, som oventil. Hos det tidligere beskrevne Yngel-Exemplar (Totall. 15 mm) vare Bentornene blot komne tilsyne paa Hovedets Overside, og vare i Frembrud paa Bugsiden, men endnu ikke fremkomne paa de øvrige Legemsdele. Heraf synes at kunne udledes, at Ujevnhederne paa Legemets Underside, der fremkomme tidligere, end paa Oversiden, afslides næsten ganske, inden Individerne have naaet sin fulde Størrelse.

Paa Finnerne gaa Bentornene ud langs Straalerne lige til Randen af Dorsalen; paa Pectoralerne beklæde de hovedsagelig de øvre Straaler, ligesom paa Caudalen. Der-

In a comparatively small-sized example (total length 50 mm), taken in the autumn of 1878, at a depth of 180 fathoms, near Rissen, in the Drontheim Fjord, by conservator Storm, and kindly sent me for examination, the fin-ray formula may be thus stated: D. 19 (6 + 13); A. 10; P. 15—17; C. 12. This individual, preserved in the collection of the Videnskabernes Selskab in Drontheim, corresponded in every respect with the other individuals (setting aside the slight disagreement in the number of fin-rays), and is more fully described in Forh. Vid. Selsk. Chra. 1879, No. 1, p. 11.

Lateral Line. — The lateral line, of which there was not even a vestige in the typical and very young specimen (total length 15 mm), is distinctly obvious in the larger examples, as an elevated series between the osseous denticles of the skin. The pores, not more than 10, are, however, so small that some difficulty is experienced in tracing them throughout the entire length of the series. The lateral line commences at the upper extremity of the gill-cover, strikes off in an oblique direction, and reaches the mesial line a short distance from the commencement of the anal, passing from thence straight to the caudal.

Along the base of the lower jaw, on either side, is a row of three deep pores; a similar series extends along the superior margin of the upper jaw, and a few pores occur too along the inferior margin of the preoperculum. Cirri on jaws wanting.

The Skin. — The skin is almost entirely covered with small clusters of granulations, so closely disposed, more particularly on the upper surface of the body, as hardly to leave any smooth portion visible. Each cluster is circular in form, and composed of about 10 spiculæ, exceedingly depressed, giving to the skin merely a rough, or slightly prickly feel. On the opercles, the clusters or groups are disposed in like manner; on the rest of the surface of the head they present a more scattered appearance, the circumference of each being considerably less. They are somewhat smaller, too, on the body below the lateral line.

In the abdominal region, as well as on the entire surface of the head, there is scarce a vestige of these clusters in the largest specimen (*c*); in the specimen next in size (*b*, total length 136 mm) they were smaller and far less numerous in the abdominal region, and altogether wanting on the under surface of the head; on the other hand, in the smallest of the individuals newly obtained (*a*, total length 93 mm) they occurred everywhere on those parts of the body, extending to the extremity of the lower jaw, and as closely disposed as on the upper surface. The fry-specimen before described (total length 15 mm) had denticles on the upper surface of the head only, they were developing on the abdominal surface; on the rest of the body they had not yet begun to appear. From these data may be inferred that the asperities on the under surface of the body, which develop earlier than on the upper, to a great extent get worn away before the fish has attained its full size.

On the fins, the denticles extend along the rays to the upper margin of the dorsal; on the pectorals, they chiefly cover the rays of the upper part, as also on the caudal. The under

imod ere Pectoralernes Underside. Analen og Ventralerne nøgne, undtagen hos Expl. *a;* hvor ogsaa Analen var ru. Paa Hovedet gaa Bentornene, som allerede nævnt, lige ud paa den Hud, der bedækker Cornea, saa at blot Partiet over Lindsen og en smal Ring omkring denne lades fri. Læberne ere ligeledes altid glatte, selv hos det mindste af de under Expeditionen erholdte Individer, der iøvrigt viser sig at være beklædt med disse Bentorne saagodtsom overalt.

Farven. Farven er hvidgraa, med mer eller mindre tydelige Pletter og brede Baand. Hos de mindre Exemplarer ere disse Pletter skarpere begrændsede, end hos de større; hos Yngelen (fra Hammerfest) fandtes saaledes blot et enkelt bredt, sort Baand, der steg op fra Bagranden af Kjæverne gjennem Øjnene, og udfyldte den mellemste Del af Hovedets Overside; et andet, noget svagere farvet Baand gik over Dorsalens bagre Del tvers over Legemet ikke langt fra Haleroden.

Hos det mindste af de nye Individer (*a*) er tilkommet paa det egentlige Legeme et bredt Baand, der gaar ud fra Roden af Pectoralerne op over Begyndelsen af Dorsalen, ligesom et smalere gaar tvers over Haleroden. Saaledes er den typiske cottoide Tegning med de 3 brede verticale Baand nedad Legemet, som fremtræder især hos de yngre Individer af et Flertal af denne Families Arter, ogsaa her tilstede.

Hos de 2 største ere Baandene noget mere utydelige; hos *b* er saavel Hovedets, som Legemets første Tverbaand næsten ganske forsvundet, medens disse hos det største Individ vel ere tilstede, men opblandede med Felter af Bundfarven.

Pectoralerne og Caudalen ere marmorerede af afbrudte Baand. Ventralerne ere ufarvede, ligesom hele Bugsiden hen til Underkjævespidsen. Derimod er Underkjæven selv, saavelsom Snuden, forsynet med uregelmæssige større Pletter.

Levemaade og Føde. Denne Art har øjensynlig, ligesom de øvrige Cottoider, sit Tilhold umiddelbart paa eller ved Bunden. Den ringeste Dybde, hvori noget af de hidtil fundne Exemplarer ere erholdte, er 191 Favne, den største 459 Favne. Som allerede ovenfor nævnt, ere alle Pectoralens Straaler i Spidsen fri, og skjønt disse fri Spidser ikke ere synderlig lange, tjene de dog utvivlsomt til Understøttelse under Krybningen om paa Bunden. Den Temperatur, som Havbunden har havt paa de Steder, hvor de erholdtes, har vexlet mellem + 3,5° C. og — 1,0° C.

Det største af de erholdte Individer var en Han, hvis Testes dog vare for Tiden lidet udviklede. Hos de yngre Ind. vare Generationsorganerne endnu ganske utydelige.

Ventrikelen af det største Individ, optaget paa 459 Favnes Dyb, fandtes fuldproppet af diverse Dyrelevninger, hvoraf kunde kjendes følgende: Smaastykker af Røret af den mærkelige Annelide *Spiochaetopterus typicus*, M. Sars, (beskreven i „Fauna Littoralis Norvegiae“, 2 H. 1856), af-

surface of the pectorals, the anal, and the ventrals are naked, except in the specimen *a*, which has also the anal rough. On the head, the denticles, as before observed, encroach on the skin covering the cornea, and thus the skin immediately above the lens, together with a narrow annular edge round it, are the only parts left free from spiculæ. The lips are always smooth; this is the case even with the smaller specimen *a*, which everywhere else appears almost entirely covered with denticles.

Colour. — Whitish-grey, relieved with spots and broad, riband-shaped bands, more or less distinct. In the smaller examples, these spots appear more sharply defined than in the larger specimens; the fry-specimen (from Hammerfest) has only one band, broad and black, which, stretching from the posterior margin of the jaws through the eyes, occupies the whole of the central portion of the upper surface of the head; a similar band traverses the posterior division of the dorsal, extending right across the body, at a short distance from the base of the tail.

In the smallest of the individuals newly obtained (*a*) a broad band has developed on the body, extending from the base of the pectorals towards the commencement of the dorsal; another and narrower band traverses the base of the tail. Thus, the typical Cottoid marking, three broad vertical bands down the body, a salient feature, particularly in young individuals, of most species belonging to this family, is also characteristic of *Cottunculus microps*.

In the two largest examples, the bands are not so distinct; in specimen *b*, the transverse bands traversing the head and body have become much fainter; in the largest example, though obvious, they are a good deal patched with the ground-colour.

The bands across the pectorals and the caudal are abruptly disconnected, giving to the surface a mottled appearance. Ventrals and abdominal surface to extremity of lower jaw whitish. Lower jaw and snout irregularly marked with large spots.

Habits and Food. — This form, in common with the other species of the family *Cottus*, must have its haunts on, or in close proximity to, the bottom. Of the examples hitherto obtained, not one was taken at a depth less than 191 fathoms, the greatest depth being 459 fathoms. As before observed, the extremities of the pectoral rays are free; and those detached points, though comparatively short, no doubt prove a great support to the fish when moving ever the surface of the bottom. The temperature at the bottom of the sea where this species was met with varied from + 3.5° C. to — 1.0° C.

The largest of the individuals was a male, with the testicles however as yet but slightly developed. In the young specimens, the generative organs were quite indistinct.

The stomach of the largest individual, taken at a depth of 459 fathoms, was found distended with the remains of divers species of marine animals, of which the following admitted of being determined: — small fragments of the alimentary canal of the remarkable Annelid species

bidte i Stykker af omtrent 8 mm Længde; Laaget og store Stykker af Legemet af *Buccinum hydrophanum*, Hanc.; medens intet Spor fandtes af Skallet, som den saaledes maa have itubidt og atter udspyttet, inden Dyret blev slugt; Smaastykker af en af de guldhaarede Annelider, der syntes at være *Laetmonice filicornis*, Kinb.; et helt Expl. af den af G. O. Sars beskrevne Isopode *Ilyarachna hirticeps*; Dele af den i næsten alle Fiskemaver optrædende Hyperide *Themisto libellula*, Mandt, samt endelig Kjæverne af en liden Unge af en Cephalopode, maaske en *Rossia*. Hos det næststørste Individ, optaget fra 459 Favne, var Ventrikelen fuldproppet af *Themisto libellula*, men indeholdt ingen andre gjenkjendelige Levninger.

Udbredelse. Ligesom de øvrige arctiske Cottoider synes *C. microps* ikke at have nogen særdeles indskrænket Udbredelse, men forekommer endnu temmelig langt mod Syd paa Dybderne udenfor de norske Kyster. Foruden Nordhavs-Expeditionens 3 Individer fra Havet omkring Spitsbergen, hvoraf det nordligste optoges under 80° N. B., foreligger, som tidligere nævnt, et Yngel-Individ fra Hammerfest i Vestfinmarken, optaget i 1874, samt en noget større Unge, optaget af Conservator Storm fra 180 Favnes Dyb i Trondhjemsfjorden Høsten 1878 (63½° N. B.). Som en ægte Bundfisk forekommer den sandsynligvis stationær paa passende Localiteter langs hele den mellemliggende Del af de norske Kyster, og utvivlsomt ogsaa ved de øvrige arctiske Landsdele eller i Havet mellem dem, idetmindste paa Ishavets europæiske Side; dog bebor den vistnok blot de større Dybder, hvor Apparaterne hidtil ikke have været fuldt hensigtsmæssige til Optagelsen af saadanne Dybvandsformer.

Gen. Cottus, Lin.

Syst. Nat. ed. 12, tom. 1, p. 451 (1766).

5. Cottus scorpius, Lin., 1766.

Cottus scorpius, Lin. Syst. Nat. ed. 12, tom. 1, p. 452 (1766).
Cottus groenlandicus, Cuv. & Val. Hist. Nat. Poiss. tom. 4, p. 156 (1829).
Cottus mitchillii, Cuv. & Val. Hist. Nat. Poiss. tom. 4, p. 188 (1829).
Cottus porosus, Cuv. & Val. Hist. Nat. Poiss. tom. 8, p. 498 (1831).
Acanthocottus labradoricus, Gir. Bost. Journ. Nat. Hist. vol. 6, p. 247, tab. 7, fig. 3 (1850).
Acanthocottus ocellatus, H. R. Storer, Bost. Journ. Nat. Hist. vol. 6, p. 253 (1850).
Cottus glacialis, Rich. Last. Arct. Voy. Belch. vol. 2, p. 349, tab. 23 (1855).

Et yngre Individ med en Totall. af 81 mm, en Hovedlængde af 27 mm, erholdtes paa ringe Dyb ved Norsk-Øerne paa Spitsbergens Nordside den 16de Aug. 1878. Intet Indiv. optoges paa de øvrige fra Land mere fjernede Stationer, og Arten er utvivlsomt en Kystform blandt Cottoiderne.

Spiochætopterus typicus, M. Sars (described in "Fauna Littoralis Norvegiæ," Part 2, 1856), about 8 mm in length; the operculum, together with large fragments of the body, of *Buccinum hydrophanum*, Hanc. (no vestige could be detected of the shell, which the fish must have crushed and ejected before proceeding to swallow the animal); small fragments of one of the golden haired Annelids, apparently *Lætmonice filicornis*, Kinb.; an entire example of the Isopod *Ilyarachna hirticeps*, G. O. Sars; portions of the Hyperoid *Themisto libellula*, Mandt, occurring in the stomachs of almost all fishes; and finally the jaws of a young Cephalopod, possibly a *Rossia*. In the specimen next in size (459 fathoms) the ventricle was distended with numerous individuals of *Themisto libellula*.

Distribution. — As is the case with the Arctic Cottoids generally, *C. microps* would not appear to have a very limited range, occurring as it does comparatively far south, in deep water off the coast of Norway. Exclusive of the three individuals obtained on the Expedition off Spitzbergen, the most northerly in lat. 80° N., a fry-specimen was, as before mentioned, taken near Hammerfest, West Finmark, in 1874, and a young example, by conservator Storm, at a depth of 180 fathoms, in the Drontheim Fjord, in the autumn of 1878 (lat. 63½° N.). As a true bottom-species, this form probably is met with stationary, in favourable localities, along the entire intermediate line of the Norwegian coast, and no doubt, too, throughout the Arctic regions generally, or the intervening tracts of ocean, at least in the European division of the Polar Sea; without doubt, however, its habitat lies at depths from which the apparatus hitherto devised has not been fully adapted for obtaining specimens.

Gen. Cottus, Lin.

Syst. Nat. ed. 12, tom. 1, p. 451 (1766).

5. Cottus scorpius, Lin. 1766.

Cottus scorpius, Lin. Syst. Nat. ed. 12, tom. 1, p. 452 (1766).
Cottus grœnlandicus, Cuv. & Val. Hist. Nat. Poiss. tom. 4, p. 156 (1829).
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Acanthocottus labradoricus, Gir. Bost. Journ. Nat. Hist. vol. 6, p. 247, tab. 7, fig. 3 (1850).
Acanthocottus ocellatus, H. R. Storer, Bost. Journ. Nat. Hist. vol. 6, p. 253 (1850).
Cottus glacialis, Rich. Last. Arct. Voy. Belch. vol. 2, p. 349, tab. 23 (1855).

A young individual, total length 81 mm, length of head 27 mm, was obtained off the Norsk Islands, northern coast of Spitzbergen, Aug. 16th 1878. No example was taken at any of the other stations farther from land; the species is undoubtedly a littoral form of the family.

Straaleantallet var: 1 D. 9; 2 D. 16; A. 13.

Udbredelse. I Europa forekommer denne Art omtrent uforandret fra Kanalen (48° N. B.) og Østersøen af, og langs Frankrigs, Storbritanniens, Danmarks, Færøernes, Norges og Sveriges Kyster lige op i Østersøen, fremdeles ved Nord-Rusland, Novaja Zemlja, Beeren Eiland og Spitsbergen, hvor den paa flere Stater, hører til de hyppigst forekommende littorale Fiske. Fremdeles er den mere eller mindre talrig ved Islands, Grønlands og det arctiske Amerikas Kyster; dog ere de Former, der bebo disse Landsdele, af forskjellige Forfattere blevne udskilte under særegne Navne, hvoraf det tidligste er *C. groenlandicus*, opstillet i 1829 af Cuv. og Val. efter den af Fabr. i hans *Fauna Groenl.* meddelte Beskrivelse. Disse Arter ere dog af Malmgren[1], Lütken[2] o. fl. henviste til Synonymernes Række, idet de samtlige gaa ind under den nævnte vestlig-arctiske Form af denne Art, *C. groenlandicus*, der maaske vil med nogen Ret kunne opføres som en constant Varietet af den normale *C. scorpius*.

Ved Nordamerikas Kyster findes, foruden den nævnte østlige Varietet, der er særdeles talrig, ogsaa Hovedarten. Den førstnævnte gaar ned til Cap Hatteras under 36° N. B.; Hovedarten er fundet, ifølge Goode & Bean (Bull. Ess. Inst. vol. XI, 1879) ved New Englands Kyster (Maine), under 44° N. B.

Number of rays: — 1 D. 9; 2 D. 16; A. 13.

Distribution. — In Europe the range of this species, as an almost constant form, extends from the British Channel (lat. 48° N.) along the coast of France, the entire coast of Great Britain, the coast of Denmark, the Faröe Islands, the coasts of Norway and Sweden, the shores of northern Russia, Novaja Zemlia, Beeren Eiland, and Spitzbergen, where it occurs, in divers localities, as one of the commonest of the littoral fishes. It is abundant, too, more or less, on the coast of Iceland and Greenland, and the Arctic shores of North America. The forms inhabiting those regions have, by some authors, been excluded as distinct species, the earliest synonym being *C. grœnlandicus*, Cuv. & Val. 1829, from the description given by Fabricius in his *Fauna Grœnlandica*. Malmgren[1], Lütken[2], however, and other ichthyologists regard these suppositious species as identical with the aforesaid west Arctic form of the species, *C. grœnlandicus*, which, perhaps, with some reason may be regarded as a constant variety of the normal *C. scorpius*.

On the shores of North America, exclusive of the aforesaid eastern variety, which occurs in great numbers, the principal species is also met with. The range of the former extends as far south as cape Hatteras, in lat. 36° N.; the principal species, according to Goode and Bean, (Bull. Ess. Inst. Vol. XI, 1879) has been observed on the coast of New England (Maine), in lat. 44° N.

Gen. Gymnacanthus, Swains.

Nat. Hist. Fish. Amph. Rept. II, p. 181 og 271. (1839.)

Hovedet fladtrykt og bredt, Kjæverne korte. Legemet trindt, uden Skjæl. Praeoperculum væbnet. Tænder i Kjæverne (ingen paa Vomer og Palatinbenene). Sidelinie tilstede. 2 Dorsaler. Gjællehinderne sammenhængende paa Hovedets Underside.

6. G. pistilliger, (Pall.) 1811.

† *Cottus gobio*, Fabr. Fauna Groenl. No. 115, p. 159 (1780).
Cottus pistilliger, Pall. Zoogr. Ross. Asiat. tom. 3, p. 143, pl. 20, 1811, trykt 1831 (1811).
Cottus ventralis, Cuv. & Val. Hist. Nat. Poiss. tom. 4, p. 194 (1829).
Cottus tricuspis, Reinh. Overs. 1829—30, Kgl. D. Vid. Selsk. Naturv. Math. Afh. 5. Del, p. LII. Kbhvn. 1832 (1829—30).
Gymnocanthus ventralis, Sw. Nat. Hist. Fish. Amph. Rept. II, p. 271 (1839).
Phobetor tricuspis, Kr. Naturh. Tidsskr. 2. Række, 1. B. p. 263 (1844).
? *Cottus intermedius*, Temm. & Schleg. Fauna Jap. Poiss. p. 38 (1850).
Acanthocottus patris, H. R. Storer, Bost. Journ. Nat. Hist. vol. 6, p. 250, pl. 7 (1850).
Cottus fabricii, Gir. Proc. Amer. Ass. Adv. Sci. vol. 2, p. 411 (1850); Proc. Bost. Soc. Nat. Hist. vol. 3, p. 189 (1850).

Gen. Gymnacanthus, Swains.

Nat. Hist. Fish. Amph. Rept. II, p. 181 and 271. (1839.)

Head broad and depressed; jaws short; body without scales; preoperculum armed; teeth in jaws, wanting on vomer and palatine bones; lateral line obvious; two dorsals; branchial membrane continuous on under surface of head.

6. G. pistilliger, (Pall.) 1811.

† *Cottus gobio*, Fabr. Fauna Grœnl. No. 115, p. 159 (1780).
Cottus pistilliger, Pall. Zoogr. Ross. Asiat. tom. 3, p. 143, pl. 20, 1811, printed 1831 (1811).
Cottus ventralis, Cuv. & Val. Hist. Nat. Poiss. tom. 4, p. 194 (1829).
Cottus tricuspis, Reinh. Overs. 1829—30, Kgl. D. Vid. Selsk. Naturv. Math. Afh. 5 Del, p. LII. Kbhvn. 1832 (1829—30).
Gymnocanthus ventralis, Sw. Nat. Hist. Fish. Amph. Rept. II, p. 271 (1839).
Phobetor tricuspis, Kr. Naturh. Tidsskr. 2. Række, 1. B. p. 263 (1844).
? *Cottus intermedius*, Temm. & Schleg. Fauna Jap. Poiss., p. 38 (1850).
Acanthocottus patris, H. R. Storer, Bost. Journ. Nat. Hist. Vol. 6, p 250, pl. 7 (1850).
Cottus fabricii, Gir. Proc. Amer. Ass. Adv. Sci. vol. 2, p. 411 (1850); Proc. Bost. Soc. Nat. Hist. vol. 3, p. 189 (1850).

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[1] Öfv. Kgl. Vet. Ak. Förh. 1864, p. 495.
[2] Vid. Medd. Nat. Foren. Kbhvn. 1876, p. 370.

[1] Öfv. Kgl. Vet. Ak. Förh. 1864, p. 495.
[2] Vid. Medd. Nat. Foren. Kbhvn., 1876, p. 370.

Gymnacanthus patris, Gill, Proc. Ac. Nat. Sci. Philad. 1861, Suppl. p. 42 (1861).
Phobetor ventralis, Malmgr. Sv. Exped. till Spetsb. och Jan Mayen 1863—64, p. 249 (1867).
Gymnacanthus tricuspis, Gill, Rep. Comm. Fish & Fisheries, 1871—72, p. 800 (1873).
Gymnacanthus pistilliger, Bean, Bull. U. St. Nat. Mus. No. 15, p. 127 (1879).

Diagn. *Hovedets Overside med chagrinartede Bentornegrupper, Legemet selv næsten glat. Sidelinien glat, retløbende, med en Sænkning ved Slutningen af 2den Dorsal, har omtr. 35 Porer. Hovedet indeholdes næsten 4 Gange i Totall., har et Par stumpe Knuder over Øjnene, ingen paa Panden eller Baghovedet. Praeoperculum har 4 Torne, den øvre lang og stærk, oftest 3-tandet, hos yngre bredt 2-delt. Pectoralen lang, Ventralerne hos Hannen lange. Farven graabrun med 3 større Rygpletter, og mere uregelmæssige Pletter nedad Siderne; Finnerne med Tverbaand. Hannen har hvide Pletter paa Bugen, samt Analpapille. Størrelsen indtil 200 mm (Hannen), eller 250 mm (Hunnen).*

M. B. 6; 1 D. 11 (10 eller 12); 2 D. 15—17; A. 16—18 (19); P. 18 (19); V. 4; C. 7/11/7. Lin. lat. 35.

Localit. fra Nordh. Exped. Spitsbergen.

	Stat. 366.
Beliggenhed.	Magdalenebay, Spitsbergen.
Dybde.	50 Favne (91 m).
Temp. paa Bunden.	— 1,0° C.
Bunden.	Mørkgraat Ler.
Datum.	17de Aug. 1878.
Antal Individer.	8 Indiv.

Bemærkninger til Beskrivelsen. De erholdte Exemplarer havde følgende Maal og Straaleantal:

	Totallængde.	Hovedets Længde.	1 D.	2 D.	A.
a.	75 mm	20 mm	10	15	17
b.	76 -	21 -	10	16	16
c.	84 -	22,5 -	11	17	18
d.	99 -	26,5 -	11	16	18
e.	115 -	31 -	11	16	18
f.	116 -	29 -	11	16	18
g.	122 -	31 -	11	15	17
h.	123 -	32 -	11	15	17

Straaleantallet varierede saaledes hos de 8 Individer i 1ste Dorsal mellem 10 og 11, i 2den Dorsal mellem 15 og 17, i Analen mellem 16 og 18. De 2 Dorsaler vare hos enkelte fuldstændigt sammenstødende, medens de hos de fleste vare fjernede fra hinanden ved et kort, men tydeligt Mellemrum.

Blot 2 af de erholdte Individer vare Hanner, og havde en forholdsvis lang Analpapille.

Hos de 2 mindste var Hovedet endnu glat, men hos de større fandtes ovenpaa Hovedet og paa Praeoperculum en Samling af fladtrykte ru Bentorne, hver omgivne (hos

Gymnacanthus patris, Gill, Proc. Ac. Nat. Sci. Philad. 1861, Suppl. p. 42 (1861).
Phobetor ventralis, Malmgr. Sv. Exped. till Spetsb. och Jan Mayen 1863—64, p. 249 (1867).
Gymnacanthus tricuspis, Gill, Rep. Comm. Fish. & Fisheries, 1871—72, p. 800 (1873).
Gymnacanthus pistilliger, Bean, Bull. U. St. Nat. Mus. No. 15, p. 127 (1879).

Diagnosis. — *Upper surface of head with groups of granulations; body almost smooth; lateral line smooth, passing straight to termination of second dorsal, at that point slightly deflected, number of pores 35; length of head one-fourth of total length; two obtuse protuberances above the eyes, none on the sinciput or occiput; preoperculum furnished with four spines, the uppermost long and powerful, generally tridented, in younger examples broad, bidental; pectorals long; ventrals long, in the male; colour greyish-brown, with three large dorsal patches and numerous spots down the sides; fins traversed by transverse bands; abdominal surface spotted with white, in the male, which is furnished with an anal papilla. Length reaching 200 mm (male) or 250 mm (female). M. B. 6; 1 D. 11 (10 or 12); 2 D. 15—17; A. 16—18 (19); P. 18 (19); V. 4; C. 7/11/7. Lin. lat. 35.*

Locality (North Atl. Exped.): Spitzbergen.

	Stat. 366.
Exact Locality.	Magdalene Bay, Spitzbergen.
Depth.	50 Fathoms (91 m).
Temp. at Bottom.	— 1.0° C.
Bottom.	Dark-grey Loam and Shingle.
Date.	17th Aug. 1878.
Numb. of Specim.	8 Indiv.

Descriptive Observations. — Dimensions of, and number of fin-rays in, specimens obtained.

	Total Length.	Length of Head.	1 D.	2 D.	A.
a.	75 mm	20 mm	10	15	17
b.	76 -	21 -	10	16	16
c.	84 -	22.5 -	11	17	18
d.	99 -	26.5 -	11	16	18
e.	115 -	31 -	11	16	18
f.	116 -	29 -	11	16	18
g.	122 -	31 -	11	15	17
h.	123 -	32 -	11	15	17

The number of fin-rays in the 8 examples varied accordingly: — 1st dorsal, between 10 and 11; 2nd dorsal, between 15 and 17; anal, between 16 and 18. In one or two of the specimens the dorsals were contiguous, in most however separated, the space between, though short, being distinctly obvious.

Two only of the specimens obtained were males, and had a rather long anal papilla.

In the two smallest individuals the head was as yet perfectly smooth; but the frontal region and the preoperculum of the largest were furnished with a cluster of depressed

det endnu fuldkommen uskadte Individ) af en Ring af Slimporer. Disse Grupper af Bentorne, der omtrent have en Lindsediameters Størrelse, danne oprindelig blot et Par Rækker, hvoraf hver strækker sig fra Øjet skraat bagover til Gjællespalten; men efterhaanden bliver Antallet større, Mellemrummet mellem de 2 Rækker opfyldes, og hos de største er en stor Del af Hovedets Overside beklædt paa denne Maade. Dog kan, ifølge Lütkens Undersøgelser, denne Hovedets Beklædning mangle endog hos udvoxede Individer.

Hos ganske unge Individer er den øvre Torn paa Praeoperculum forholdsvis længere, end hos de ældre, idet den med sin Spidse næsten naar til den bagre Rand af Operculum. Hos Ind. med en Totallængde af indtil 80mm er den i Spidsen endnu blot grundt tvedelt, medens den først hos de ældre Individer er skarpt og tydeligt tretandet; et udvoxet Individ (fra Vadsø i Finmarken, en Hun) har endog den højre Torn 4-delt, den venstre med 5 tydelige Tænder[1].

Føde. Hos et af de erholdte Individer var Ventrikelen udspændt af Smaastykker af Annelider *(Polynoë)*. De Individer, som jeg i 1874 havde Lejlighed til at undersøge i Varangerfjorden i Øst-Finmarken, indeholdt blot Crustaceer, tilhørende forskjellige Arter Gammarider og Idotheer.

Udbredelse. *G. pistilliger* (bedre kjendt som *Phobetor ventralis* eller *Ph. tricuspis)* er sandsynligvis endnu den eneste sikkert bekjendte Art af sin Slægt, der iøvrigt kun ved Mangelen af Vomerintænder adskiller sig fra Slægten *Cottus*. Dens Synonymi er udtømmende behandlet af Dr. Lütken i Vid. Medd. Naturh. Foren. Kbhvn. 1876, p. 363. I sin Udbredelse synes den at være næsten ganske circumpolær, og den vil neppe savnes paa noget nøjere undersøgt Gebet af de til Europas, Asiens og Americas Kyster stødende Dele af Ishavet. Allerede i 1780 blev den af Fabricius beskreven fra Grønland (under Navn af *Cottus gobio)*; senere er den bleven bekjendt fra Kamtschatka og Beringshavet lige ned til Japan, samt vestover langs Asiens Nordkyst til Kysterne af Novaja Zemlja, Spitsbergen, Finmarken i Norge, fremdeles ved Island, Grønland og det arctiske America ned til Nova Scotia under 45° N. B. Paa flere af disse Localiteter, saaledes ved Spitsbergen, er den særdeles talrig.

[1] „Norges Fiske", p. 30 (1874).

osseous granulations, each (in the specimen exhibiting no trace of mutilation) surrounded by a ring of mucous pores. These clusters of granulations, in size about equal to the diameter of the lens, are first arranged in two rows, extending from the edge of the eye to the branchial opening, but, gradually increasing in number, they encroach upon the intermediate space; and in the largest specimens a very considerable portion of the upper surface of the head is armed in this manner. According to Lütken, however, this spinous covering does not always occur even in full-grown individuals.

Very young examples have the uppermost spine on the preoperculum proportionately longer than individuals in a more advanced stage of growth, the tip of the point almost reaching to the posterior margin of the operculum. In examples with a total length of 80mm, this spine, at the point, is still obtuse bipartite, maturer individuals only having it sharp and distinctly trifurcate; in an adult specimen (a female, from Vadsø, in Finmark) the spine on the right side was furcated with four, that on the left with five well-defined denticles.[1]

Food. — In one of the specimens examined the stomach was distended with small fragments of Annelids *(Polynoë)*. The ventricles of the individuals I had the opportunity of examining in 1874, in the Varanger Fjord, East Finmark, contained only remains of crustaceans, *Gammaridæ* and *Idotheæ*.

Distribution. — Up to the present time *G. pistilliger* (better known as *Phobetor ventralis* or *Ph. tricuspis*) is the only well determined species of its genus, the sole character distinguishing it from the genus *Cottus* being the absence of vomerine teeth. Its synonymy has been exhaustively treated of by Dr. Lütken, in Vid. Medd. Naturh. Foren. Kbhvn. 1876, p. 363. In its distribution it would appear to be almost circumpolar, and will hardly fail to be met with throughout any region of the Arctic Ocean off the shores of Europe, Asia, and America. As far back as 1780, Fabricius described the species (under the name of *Cottus gobio*) as occurring on the coast of Greenland; more recently it has been met with off Kamtschatka and Bering's Straits, as far east as Japan, and, in a westerly direction, along the northern coast of Asia, as far as Novaja Zemlja, Spitzbergen, Finmark, Iceland, Greenland, and Arctic America, and southwards, off Nova Scotia, in lat. 45° N. In many of these localities, e. g. on the coast of Spitzbergen, it is exceedingly numerous.

[1] "Norges Fiske," p. 30 (1874).

Gen. Centridermichthys, Richards.

Zool. Voy. Sulph. Fishes, p. 73 (1843).

Hovedet forholdsvis fladtrykt og bredt, Legemet trindt, glat eller granuleret. Praeoperculum væbnet. Tænder i Kjæverne, paa Vomer og paa Palatinbenene. Sidelinie tilstede. 2 Dorsaler. Gjællehinderne sammenhængende paa Hovedets Underside.

7. Centridermichthys uncinatus, (Reinh.) 1833—34.

(Pl. I. fig. 7).

Cottus uncinatus, Reinh. Overs. 1833—34, Kgl. D. Vid. Selsk. Naturv. Math. Afh. 6. Del, p. XLIV, Kbhvn. 1837 (1833—34).
Icelus uncinatus, Kr. Naturh. Tidsskr. 2. Række, 1. B., p. 263 (1844).
Centridermichthys uncinatus, Günth. Cat. Fish. Brit. Mus. Vol. 2, p. 172 (1860).

Diagn. *Legemet overalt glat, ligesom Sidelinien; den sidste bestaaende af omtr. 18 Porer. Hovedet indeholdes* $3^1/_2$ *Gange i Totall. Øjnene særdeles tætstaaende og store, indeholdes omtrent* $2^1/_5$ *Gange i Hovedlængden. Pracoperculum har 2 Torne, den øvre kloformig krummet og særdeles skarp. Et Par stumpe Knuder paa Baghovedet. Bundfarven hvidagtig med graabrune Pletter, der hos de Yngre oftest ere 3 nedad Ryggen, men mere uregelmæssige hos de Ældre. Analpapille mangler. Størrelsen indtil 100 mm.*

M. B. 6. 1 D. 7—8; 2 D. 13 (12 eller 14); A. 11; P. 18—19 (20—21); V. 4; C. 4/11/4. Lin. lat. 18.

Localit. fra Nordh. Exped. Havet mellem Nordcap og Spitsbergen.

	Stat. 262.	*Stat.* 275.	*Stat.* 290.	*Stat.* 323.	*Stat.* 326.
Beliggenhed.	50 Kil. Ø. Vardø.	370 Kil. Ø. Beeren Eiland.	210 Kil. N.V. Hammerfest.	180 Kil. SO. Beer. Eiland.	100 Kil. S. Spitsbergen.
Dybde.	148 Favne (271 m).	147 Favne (269 m).	191 Favne (349 m).	223 Favne (408 m).	123 Favne (225 m).
Temp. p. Bunden.	+ 1,9° C.	— 0,4° C.	+ 3,5° C.	+ 1,5° C.	+ 1,6° C.
Bunden.	Ler.	Grønligt Ler.	Sandholdigt Ler.	Brungraat Ler.	Mørkt Ler.
Datum.	27de Juni 1878.	2den Juli 1878.	7de Juli 1878.	30te Juli 1878.	3die Aug. 1878.
Antal Indiv.	1 Indiv.	3 Indiv.	4 Indiv.	1 Indiv.	3 Indiv.

Bemærkninger til Synonymien. Slægten *Centridermichthys*, opstillet af Richardson i Zool. Voy. Sulph. Fishes p. 73 (1843) for et Antal cottoide Fiske fra det arctiske Nord-America samt Nordost-Asiens Kyster, adskiller sig alene ved Tilstedeværelsen af Tænder paa Palatinbenene fra den typiske Slægt *Cottus*. Hidtil er alene en enkelt Art, *C. uncinatus*, (Reinh.), funden i Europa; denne opstilledes af Reinhardt sen. fra Grønland i 1833 under Navnet *Cottus uncinatus*.

Den korte Diagnose, hvormed Reinhardt ledsagede sin nye Art, er indtil de seneste Aar bleven uden Tillæg gjentaget, saaledes i 1844 af Krøyer (Naturh. Tidsskr. 2den

Gen. Centridermichthys, Richards.

Zool. Voy. Sulph. Fishes, p. 73 (1843).

Head comparatively depressed and broad: body plump, smooth or granulated; preoperculum armed; teeth in jaws, on vomer, and palatine bones. Lateral line obvious; two dorsal fins; branchial membrane continuous on the under surface of the head.

7. Centridermichthys uncinatus, (Reinh.) 1833—34.

(Pl. I. fig. 7.)

Cottus uncinatus, Reinh. Overs. 1833—34, Kgl. D. Vid. Selsk. Naturv. Math. Afh. 6. Del p. XLIV, Kbhvn. 1837 (1833—34).
Icelus uncinatus, Kr. Naturh. Tidssk. 2. Række, 1. B. p. 263 (1844).
Centridermichthys uncinatus, Günth. Cat. Fish. Brit. Mus. Vol. 2, p. 172 (1860).

Diagnosis. — *Body and lateral-line smooth; the latter consisting of 18 pores; length of head to total length as 1 to* $3^1/_2$*; eyes exceedingly close together, and large, longitudinal diameter to length of head as 1 to* $2^1/_5$*; two spines on preoperculum, the upper ungueal, hooked, and exceedingly sharp; two blunt obtuse protuberances on the occiput; ground colour whitish, with greyish brown spots, generally three in young examples, varying more in adults. Anal papilla wanting; length reaching 100 mm.*

M. B. 6. 1 D. 7—8; 2 D. 13 (12 or 14); A. 11; P. 18—19 (20—21); V. 4; C. 4/11/4. Lin. lat. 18.

Locality (North Atl. Exped.): — The open sea, between the North Cape and Spitzbergen.

	Stat. 262.	*Stat.* 275.	*Stat.* 290.	*Stat.* 323.	*Stat.* 326.
Exact Locality.	50 Kik E. of Vardø.	370 Kil. E. of Beeren Eiland.	210 Kil. NW. Hammerfest.	180 K. SE. Beeren Eiland.	100 Kil. S. Spitzbergen.
Depth.	148 Fath. (271 m).	147 Fath. (269 m).	191 Fath. (349 m).	223 Fath. (408 m).	123 Fath. (225 m).
Temp. at Bottom.	+ 1.9° C.	— 0.4° C.	+ 3.5° C.	+ 1.5° C.	+ 1.6° C.
Bottom.	Clay.	Greenish Clay.	Sandy Clay.	Brownish-grey Clay.	Dark Clay.
Date.	27th June 1878.	2nd July 1878.	7th July 1878.	30th July 1878.	3rd Aug. 1878.
Numb. of Specim.	1 Indiv.	3 Indiv.	4 Indiv.	1 Indiv.	3 Indiv.

Remarks on the Synonymy. — The genus *Centridermichthys*, etablished by Richardson in Zool. Voy. Sulph. Fishes, p. 73 (1843) for divers Cottoid fishes occurring in the Arctic regions of North America and off the north-eastern shores of Asia, is distinguished from the typical genus *Cottus* solely by the presence of teeth on the palatine bones. Up to the present time, but a single species, *C. uncinatus*, (Reinh.), has been met with in Europe; it was first described by Reinhardt sen. from the coast of Greenland, in 1833, under the name of *Cottus uncinatus*.

The brief diagnosis given by Reinhardt has been copied, till but a few years since, without addition, by Krøyer, in 1841 (Naturh. Tidsskr. 2. Række, 1. Bind), and by Gün-

Række, 1ste B.), og i 1860 af Günther (Cat. Fish. Brit. Mus. vol. 2), hvilke begge ikke kjendte Arten af Autopsi. I 1868 anmeldtes den af Professor Esmark fra Finmarkens Kyster (Forh. Skand. Naturf. 10de Møde), ligesom Dr. Lütken i 1876 gav en Del Bemærkninger om Arten i Medd. Nat. Foren. Kbhvn. for samme Aar. Nogen udførligere Beskrivelse er, saavidt vides, ikke fremkommet, uden i 1874 i Forfatterens Afhandling „Norges Fiske" (efter Exemplarer fra Norge), ligesom den hidtil ikke har været afbildet. Jeg gjengiver derfor her Artens Beskrivelse, sammenholdt med de nytilkomne og vel vedligeholdte Exemplarer fra Nordhavs-Expeditionen.

Beskrivelse. *Legemsbygning.* Fra alle de øvrige nordatlantiske Cottoider kan *C. uncinatus* i Regelen let kjendes ved sin af faatallige og store Porer dannede Sidelinie, der især hos yngre Individer er iøjnefaldende, i Forbindelse med hele Legemets Glathed, idet dette ikke viser Spor af Protuberantser eller Granulationer. Særdeles characteristisk er fremdeles den krogformige Klo paa Praeoperculum, medens Palatintænderne først blive tydelige hos de noget større Unger.

Legemet har iøvrigt den for den nærstaaende Slægt *Cottus* almindelige Form, idet Hovedet er temmelig fladtrykt, og det egentlige Legeme er fortil næsten trindt, bagtil mere sammentrykt.

Hovedet er bredt ægformigt, og indeholdes hos de udvoxede omkring $3^1/_2$ Gange i Totallængden, eller lidt over $2^1/_2$ Gange i Legemets Længde uden Caudal. Øjnene ere særdeles tætstaaende, saaledes, at Benbroen mellem Orbitae blot er en Brøkdel af Lindsens Diameter. De ere tillige overordentlig store; deres Længdediameter er saaledes betydeligt større, end Snudens Længde, og udgjør omtrent $2^4/_5$ af Hovedets Længde.

Størrelsen af Crystallindsen er en mærkelig Variation underkastet, idet denne, som bekjendt, plejer at være constant af samme Størrelse hos ligestore Individer af samme Art. Medens saaledes hos det største af de under Expeditionen erholdte Individer, hvis Totall. var 83 mm, Lindsen havde en Diameter af 2,5 mm, var den hos et yngre Individ, hvis Totall. var blot 68 mm, omtr. 3,5 mm; andre udviste Overgange mellem begge. Nogen Forskjel i Legemsbygningen forøvrigt kunde ikke opdages; heller ikke stod denne Variation i noget bestemt Forhold til Dybden, idet netop det største Individ var taget paa det grundeste Vand (123 Favne), og det mindre paa en kun ubetydeligt større Dybde (148 Favne).

Tænderne ere temmelig fine, og tilstede (foruden i Kjæverne) tillige paa Vomer og paa Palatinbenene. Hos Unger, med en Totall. af under 20 mm ere Vomerin- og Palatintænderne endnu ikke fremkomne. Gjællehinderne ere sammenhængende paa Hovedets Underside; Antallet af Gjællestraaler er 6.

Kjæverne ere omtrent af samme Længde; dog bevirker den tykkere Overlæbe, at Overkjæven synes ubetydeligt længere, end Underkjæven.

ther, in 1860 (Cat. Fish. Brit. Mus. Vol. 2), neither of whom knew the fish from autopsy. In the year 1868 Professor Esmark gave notice of its occurrence on the coast of Finmark (Forh. Skand. Naturf. 10 Møde); and in 1876 Dr. Lütken communicated sundry observations on the species in Medd. Nat. Foren. Kbhvn. for that year. No full description however had, we believe, appeared previous to that given in "Norges Fiske" (1874), from Norwegian specimens; nor has the species yet been figured. The detailed description, supplemented from an examination of the specimens — in an excellent state of preservation — obtained on the North Atlantic Expedition, is given below.

General Description. *Structure of the Body.* — *C. uncinatus* may as a rule be readily distinguished from all other North Atlantic Cottoids by the large size and fewness of the pores constituting its lateral line, a conspicuous character, more particularly in young examples; moreover, by the smoothness of the skin, not a vestige of granulations or protuberances can be detected in any part of the body. Another salient feature is the ungueal spine on the preoperculum; the palatine teeth, on the contrary, are not developed in very young individuals.

In other respects the form and structure of the body corresponds with that of the allied genus *Cottus*, the head being considerably depressed and the body roundish, the posterior part somewhat compressed.

Head broad, ovate; length to total length, in adult examples, about as 1 to $3^1/_2$ or, to length of body, exclusive of caudal, a trifle more than as 1 to $2^1/_2$. Eyes set exceedingly close, the length of the osseous ridge between the orbits being but a fraction of the diameter of the lens; they are also remarkably large, the longitudinal diameter considerably exceeding the length of the snout and nearly equal to $2^4/_5$ of the length of the head.

The size of the crystal lens, generally constant in individuals of equal dimensions belonging to the same species, varies remarkably in *C. uncinatus*. In the largest of the specimens obtained on the Expedition, total length 83 mm, the diameter of the lens was 2.5 mm, whereas in a younger example, total length not more than 68 mm, it reached 3.5 mm; others represented the transition stages. No other difference could be detected in the form and structure of the body; nor was this characteristic peculiarity in any way dependent on depth, the largest individual having been taken in the shallowest water (123 fathoms), and the small example at a depth but very little greater (148 fathoms).

Teeth — rather slender — on the vomer and palatine bones, and in the jaws. In young examples, total length less than 20 mm, the vomerine and palatine teeth were not yet developed. Branchial membrane continuous on under surface of head; brancheostegals 6.

Jaws equal in length, the upper, however, appearing to be somewhat longer than the lower, from the thickness of the upper lip.

Praeoperculum har 2 Torne, den nederste kort, nedadrettet, og lidet fremtrædende; den øverste lang og krogformigt bøjet indad, overordentlig spids og stærk, samt fra oven og neden noget sammentrykt; med sin Spidse naar den ikke tilbage til den øvre Flig af Operculum. I fuldkommen uskadt Stand er denne kloformige Torn lige ud til Spidsen beklædt med Hud, der ganske udfylder dens indre concave Del. Ved Grunden af den store Torn findes paa Forsiden en mindre, der dog hos uskadte Individer neppe lader sig iagttage, uden ved Følelsen. Operculum har en enkelt Torn nedentil, men ender oventil i en blød og afrundet Flig, nedenfor hvilken der skjuler sig en lav, men skarp Torn. Mellem det forreste og bagre Par Næsebor findes et Par korte opstaaende Torne, og paa Baghovedet et Par lignende, der ere bagudrettede, men som alle ere, ligesom de øvrige Torne, lidet fremtrædende af Huden.

Sidelinie, Porer og Hudtraade. En Række af 5—6 Porer strækker sig fra det forreste Par Næsebor paa hver Side bagover under Øjet; og standser omtrent ved Bagkanten af Orbita. Lignende Rækker strække sig paa Undersiden af Underkjæven.

Sidelinien er hos de yngre Ind. dannet af store og aabentstaaende Porer, hvis Antal sjelden overstiger 18, skjønt det ikke altid er det samme paa begge Sider. Hos de ældre Ind. ere Porerne mindre, men deres oprindelige Omkreds kan endnu sees som afbrudte, lidt ophøjede Ringe. Hos Yngel med en Totall. af under 12 mm er Sidelinien endnu usynlig, men allerede, hvor Legemet har naaet en Længde af 15 mm, ere omtrent 5—6 Porer fremkomne paa Legemets forreste Del.

Af Hudtraade paa Hovedet findes en yderst kort paa Bagranden af Overkjæven, umiddelbart foran Mundvinkelen, altsaa paa samme Punkt, hvor en lignende er tilstede hos *Cottus bubalis* og *C. lilljeborgii*. Hos alle uskadte Individer findes endvidere en enkelt Traad ved den øvre Rand af Orbita, der ikke (som hos *Icelus hamatus*) er haandformig fladtrykt, men tilspidset; denne gaar let tabt ved Berøring.

Finnerne. Straaleantallet synes idethele at være en forholdsvis ringe Variation underkastet, sammenlignet med, hvad der finder Sted hos *Icelus hamatus* og flere andre Cottoider.

1ste Dorsal har 7 eller 8 Straaler, der begynde umiddelbart over Pectoralernes øvre Fæste, og ende noget bagenfor Anus. Den har ingen betydelig Højde, idet denne sjeldent overstiger Hovedets halve Længde.

2den Dorsal har 13 Straaler, hos enkelte Individer 12 eller 14, og begynder uden Interdorsalrum bag 1ste Dorsal; den har noget større Højde, end denne, og naar med Spidsen af sine længste Straaler i omtr. en halv Orbitaldiameters Afstand fra Roden af Caudalen, eller undertiden kortere.

Two spines on preoperculum, the lower short, inclining downwards, and but slightly developed; the upper long, hooked, remarkably sharp and powerful, above and below slightly depressed; the point does not reach back to the upper edge of the operculum. Specimens in perfect preservation have this strong hooked spine protected to the apex by the integument, which fills up and conceals the inner groove. At the base of the large spine, on the anterior side, occurs a smaller one, which, however, in well-preserved examples can hardly be observed, save by the touch. Operculum furnished below with a single spine; above, it terminates in a soft, convex flap, concealing beneath a depressed, but sharp-pointed spine. Between the anterior and posterior pairs of nostrils occur two short spines, and, on the occiput, two others, all of which, however, in common with the other spines, are directed backwards, and project but slightly above the integument.

Lateral Line, Mucous Pores, and Cirri. — A row of 5 or 6 pores extends from the anterior nostrils, on each side, backwards under the eye, terminating in close proximity to the posterior edge of the orbita. Similar series occur on the under surface of the lower jaw.

In young examples, the lateral line is composed of large and open pores, seldom exceeding 18, which, however, are not always equal in number on both sides. In more mature individuals the pores are smaller; their original circumference being, however, distinctly obvious, as disrupted and slightly protuberant rings. In fry-specimens (having a total length of less than 12 mm), the lateral line cannot yet be distinguished, but so soon as the body has attained a length of 15 mm, 5 or 6 pores are obvious in the anterior region.

The head is furnished with one cirrus, exceedingly short, on the posterior margin of the upper jaw, immediately in front of the angle of the mouth, in the exact spot where a similar cirrus occurs in *Cottus bubalis* and *C. lilljeborgii*. In perfect specimens a cirrus is also observed on the superior margin of the orbits, tapering to a point (not thin and riband-shaped as in *Icelus hamatus*); being very slenderly attached to the skin, great care must be taken to preserve it uninjured.

Fins. — In *C. uncinatus* the number of fin-rays is apparently subjected to but slight variation as compared with this feature in *Icelus hamatus* and divers other species of Cottoids.

The first dorsal, furnished with 7 or 8 rays, commences immediately above the upper extremity of the base of the pectorals, and terminates at a short distance behind the anus; its height is not considerable, rarely exceeding half the length of the head.

The 2nd dorsal has 13, in some individuals 12 or 14 rays; it is contiguous to the 1st dorsal, exceeding it however somewhat in height, the tip of the longest rays extending to a distance of about half the diameter of the orbit from the base of the caudal, sometimes not quite so far.

Analen har 11 Straaler, og begynder umiddelbart bag Anus; den har Højde og Udstrækning omtr. som 2den Dorsal, og slutter i en neppe kjendelig større Afstand fra Caudalens Rod, end denne.

Pectoralerne, der tælle 18 Straaler, undertiden 19—21, ere bredt afrundede, som hos Slægten *Cottus*; i Spidsen ere de nedre Straaler fri og noget fortykkede. Tilbageslaaede naa de med Spidserne langt forbi Anus, eller (hos de udvoxede Individer) ved eller noget forbi Begyndelsen af 2den Dorsal.

Ventralerne ere forholdsvis lange, og naa med sine fri Spidser næsten til Anus. De have 4 Straaler.

Caudalen har 11 leddede Straaler, der i sin ydre Fjerdedel ere kløvede. Paa hver Side af de leddede Straaler findes 3—4 uleddede Støttestraaler, der dog kunne være næsten rudimentære.

Farven. Denne viser hos de yngre Individer den sædvanlige Fordeling af 3 graabrune Tverbaand tversover Legemet, hvis Bundfarve er hvidagtig; det mellemste af disse Tverbaand, der udgaar fra Grunden af 2den Dorsal, er bredest, og har omtr. en Orbitaldiameters Bredde. Hos ældre Individer ere Tverbaandene ikke saa skarpt tegnede, idet de ofte indeslutte Felter af den lyse Bundfarve, ligesom ogsaa Mellemrummene mellem dem kunne være saa opfyldte af Smaapletter, at Tverbaandene blive ganske utydelige.

Finnerne, hvis Grundfarve er hvid (især hos de ældre), ere forsynede med skarpttegnede, skraatløbende Tverbaand; svagest tegnet er Analen, hvis Tverbaand oftest ere utydelige. Iøvrigt er saavel Finnernes, som Legemets Farvetegning ikke ubetydeligt varierende hos de forskjellige Individer.

Spæd Yngel, hvoraf jeg har et stort Antal fra Varangerfjorden med en Totall. af indtil 10 mm, have en ret characteristisk Farvetegning, idet et sort Baand strækker sig rundt Nakken og Struben som et Halsbaand; paa Siderne af Legemet gaar dette mørke Parti ud som en bred Stribe.

Forplantning, etc. Yngletiden for denne Art falder sandsynligvis i Juli og August, da flere af de erholdte Individer havde Bugen stærkt udspilet af Rogn. Et af disse (fra Stat. 275), der erholdtes den 2den Juli, og som havde en Totall. af 69 mm, havde omtr. 32 Rogn i hvert Ovarium; disse Rogn havde en forholdsvis betydelig Størrelse, idet deres Diameter var omtr. 2 mm. Foruden disse 64 Rogn, der alle vare jevnstore, og syntes at være fuldmodne, fandtes et Antal yderst fine Rognkorn, der vare forblevne uudviklede.

Individernes Størrelse varierede hos de fleste mellem 66 og 83 mm, og de maa, da de viste sig forplantningsdygtige, have været fuldvoxne eller nær derved. Dr. Lütken har undersøgt et Exemplar fra Grønland (i Musæet i Kbhvn.), der havde en Totallængde af 100 mm.

The anal, furnished with 11 rays, commences immediately behind the vent; height and extent about that of second dorsal; it terminates, too, very nearly at the same distance from the base of the caudal, as does that fin.

The pectorals, furnished with 18 rays, sometimes 19—21, are broad and rounded, as in the genus *Cottus;* extremities of lower rays free and somewhat thick. Directed backwards, the points extend some distance past the vent; or (in full-grown specimens) a short distance beyond the commencement of the second dorsal.

The ventrals are comparatively long, the free points extending almost to the vent; number of rays 4.

The caudal is furnished with 11 articulated rays, cleft in their outer fourth. On either side of the articulated rays occur 3—4 auxiliary rays without articulation, which, however, in some examples are almost rudimentary.

Colour. — Young individuals exhibit the normal distribution: 3 greyish brown transverse bands across the body, ground-colour whitish; the middle band, commencing at the base of the second dorsal, is the broadest, having a breadth about equal to the diameter of the orbit. In maturer individuals the transverse bands are less distinctly traced, being broken up with patches of the ground-colour; the intermediate space, too, is blurred with such a multitude of spots and macules as to be frequently almost confluent with the bands.

The fins, the ground-colour of which is whitish, are (more particularly in mature examples) marked with well-defined, oblique transverse bands; marking of anal faint, the transverse bands being frequently indistinct. For the rest, both the fins and the body generally display very considerable variation in the distribution of colour.

Fry in the earliest stage of growth, of which I am in possession of a large number of specimens from the Varanger Fjord (total length 10 mm), exhibit a most characteristic peculiarity of marking, a black band encircling the throat and nuchal region like a necklace; on the sides, this dark colour stretches posteriorly in the form of a broad stripe.

Propagation &c. — The spawning season of this species is probably in the months of July and August, the abdomen in several of the specimens obtained having been found distended with roe. One (Station 275), taken July 2nd, total length 69 mm, had about 32 ova in each ovary; these ova were comparatively of large size, the diameter being about 2 mm. Exclusive of these ova, 64 in number, all of which were large and apparently mature, the ovaries contained a number of minute ovarious germs, which had remained undeveloped.

The dimensions varied in most of the individuals between 66 and 83 mm, and these specimens, seeing they were about to spawn, must have been full-grown, or very nearly so. Dr. Lütken has examined an individual from the coast of Greenland (preserved in the Zoological Museum, Copenhagen) with a total length of 100 mm.

Ventrikelen indeholdt hos de undersøgte Individer følgende: Hos 3 Individer fra en Dybde af 191 Favne (Stat. 290), hvor Bunden bestod af sandholdigt Ler, indeholdt Ventrikelen hos det ene Anneliden *Notomastus latericeus*, M. Sars; hos det andet ligeledes en Annelide, *Chloraema pellucidum*, M. Sars; det tredie havde Ventrikelen fyldt med smaa Mollusker, som (ifølge Bestemmelse af Dr. Friele) vare *Velutina undata*, Brown, og *Yoldia intermedia*, M. Sars. Et Individ fra Stat. 275 (fra 147 Favnes Dyb) havde Ventrikelen fyldt med forskjellige smaa Annelider, hvoraf kunde kjendes en *Clymene* og en liden *Polynoë*, der dog ikke lode sig nærmere bestemme.

Samtlige disse Dyr ere Bunddyr, og Arten lever utvivlsomt, ligesom de øvrige cottoide Former, umiddelbart paa og ved Bunden, hvad der ogsaa fremgaar af dens Legemsbygning.

Udbredelse. *Centrid. uncinatus* er en arctisk Art, der sandsynligvis optræder paa den noget grundere Havbund paa de fleste Steder mellem Grønland, Spitsbergen, Novaja Zemlja og Norge. Oprindelig blev Arten beskreven af Reinh. sen. i 1833—34 efter Exemplarer fra Grønlands Sydkyst (Nennortalik i Julianehaabs Distrikt). Senere er den fra og til nedsendt til Musæet i Kjøbenhavn fra Grønland, men synes, ifølge Dr. Lütken, ikke at forekomme talrigt her. At den ikke indsamledes under den engelske Nordpol-Expedition i 1875—76 i de nordgrønlandske Farvande mellem 78° og 83°, synes forklarligt, naar man betragter dens forholdsvis sydlige Udbredelse i Europas arctiske Egne. Den er nemlig hidtil ikke fundet under nogen af de talrige Expeditioner omkring Spitsbergen; det nordligste Punkt, hvor den hidtil vides iagttagen, er paa den ovenfor nævnte Stat. 326, under 75° 31′, eller omtr. midtveis mellem Beeren Eiland og Spitsbergen; imidlertid tør det med Sikkerhed forudsættes, at den naar op til de sydligste Dele af denne Øgruppe. Mellem Spitsbergen og Norges Kyster synes den at være jevnt udbredt over Havbunden, hvor denne hæver sig op til et Par Hundrede Favnes Dybde, hvorimod den ikke erholdtes paa de vestenfor liggende større Dyb; mod Øst gaar den idetmindste til Novaja Zemlja, hvor et Par Individer erholdtes ved Sælhundbugten, under Heuglins Expedition i 1871, hvilke afgaves til Universitetsmusæet i Christiania af Expeditionens Deltager, Cand. Aagaard.

Ved Jan Mayen erholdtes intet Individ under Nordhavs-Expeditionens (vistnok ikke særdeles talrige) Skrabninger omkring denne Ø i 1877; heller ikke er den hidtil fundet ved Island.

Langs Norges Kyster optræder den paa forskjellige Punkter fra Varangerfjorden og Nordkap af, og ned til Stavangerfjorden, som det synes, ikke særdeles sparsomt. Den sidstnævnte Localitet (59°) er det sydligste Punkt, hvor Arten hidtil er observeret, men den vil sandsynligvis ogsaa vise sig at bebo Bankerne udenfor Orknøerne og Shet-

The *ventricles* of the specimens examined were on dissection found to contain marine animals of the following species: — Of 3 individuals taken at a depth of 191 fathoms (Station 290), bottom argillaceous clay, I found a *Notomastus latericeus*, M. Sars, in the stomach of one; in that of the second, an example of another Annelid, *Chloræma pellucidum*, M. Sars; that of the third was full of small mollusks, belonging (as determined by Dr. Friele) to the species *Velutina undata*, Brown, and *Yoldia intermedia*, *M. Sars*. An individual taken at Station 275 (depth 147 fathoms) had its ventricle full of divers small Annelids, among which a *Clymene* and a small *Polynoë* admitted of being determined.

These animals are all of them bottom-species, and *C. uncinatus*, in common with the other Cottoid forms, unquestionably has its habitat either directly on, or very near to, the bottom, a circumstance also explained by the structure of its body.

Distribution. — *Centr. uncinatus* is an Arctic species; occuring, where the bottom is comparatively shallow, in most localities between Greenland, Spitzbergen, Nova Zemlja, and Norway. The species was first described by Reinhardt sen., 1833—34, from specimens taken on the south coast of Greenland (Nennortalik, in the district of Julianehaab). More recently it has now and again been sent from Greenland to Copenhagen, but, according to Dr. Lütken, does not seem to be common there. Its not having been taken on the English Polar Expedition (1875—76) off North-Greenland, in lat. between 78° and 83° N., is hardly a matter of surprise, if we consider the comparatively southern range of the species in the Arctic regions of Europe. Hitherto no example has been obtained from the shores of Spitzbergen; the most northerly point at which, up to the present time, it is known to have been observed, is Station 326, mentioned above, in lat. 75° 31′ N., or about mid-way between Beeren Eiland and Spitzbergen; we may however safely regard its range as extending to the southern part of that group of islands. Between Spitzbergen and the coast of Norway it would appear to be equably distributed over the surface of the bottom in all localities where the depth of the ocean does not exceed a couple of hundred fathoms; further west, at greater depths, it has not been met with. In an easterly direction the species occurs at least as far as Nova Zemlja, where two examples were taken on Heuglin's Expedition in 1871, in Seal Bay, by Dr. Aagaard.

Off the coast of Jan Mayen no individual of this species was obtained on the Expedition when dredging (not very frequently, it is true) round that island, nor has it as yet been observed on the coast of Iceland.

On the Norwegian coast it occurs in divers localities, from the Varanger Fjord and the North Cape as far south as Stavanger; and apperently not as a rare species. The last-mentioned locality (in lat. 59° N.) is the most southerly point at which the species has been observed; probably, however, it will be found to inhabit the banks

landsøerne, saavel som Færøerne, Island, og mod Øst det kariske Hav.

Ved de amerikanske Kyster synes den atter at forekomme talrigt, og at gaa særdeles langt mod Syd. Den optræder saaledes i stort Antal paa Dybderne i Massachusetts Bay ved New England-Staterne under 41° N. B. (Goode & Bean, 1879).

Gen. Icelus, Kr.

Naturh. Tidsskr. 2 Række, 1 B. p. 261, Kbhvn. 1844—45 (1844).

Hovedet forholdsvis sammentrykt. Legemet fortil trindt, bagtil stærkt sammentrykt. Huden tildels granuleret, og forsynet med en Række Bentorne langs Ryggen; Sidelinien ligeledes med skarpe Bentorne. Tænder (som hos Centridermichthys) tilstede i Kjæverne, paa Vomer, og paa Palatinbenene. Praeoperculum væbnet. 2 Dorsaler. Gjællehinderne sammenhængende paa Hovedets Underside.

8. **Icelus hamatus**, Kr. 1844.

Pl. I, Fig. 8.

? *Cottus bicornis*, Reinh. Overs. 1839, Kgl. D. Vid. Selsk. Naturv. Math. Afh. 8 Del, p. LXXV, Kbhvn. 1841 (1839).
Icelus hamatus, Kr. Naturh. Tidsskr. 2 Række, 1 B. p. 253 og 261 (1844).
? *Centridermichthys bicornis*, Günth. Cat. Fish. Brit. Mus. vol. 2, p. 172 (1860).
? *Icelus bicornis*, Gill, Proc. Acad. Nat. Sci. Philad. 1861, Suppl. p. 42 (1861).
Icelus furciger, Malm, Förh. Skand. Naturf. 9 Möte 1863, p. 410 (1863).

Diagn. *Legemet oventil tæt granuleret, ligesom Hovedet. Tornene langs Ryggen og i Sidelinien fint tandede; ofte findes tillige en kortere Tornerække langs Analen, samt spredte Bentorne langs Siderne. Hovedet indeholdes $3^1/_2$—4 Gange i Totall. Øjnene store og tætstaaende, indeholdes omtr. 3 Gange i Hovedlængden. Praeoperculum har 4 Torne, den øverste med kløvet Spidse; 1 Par Knuder over Øjnene, 2 Par paa Panden. Sidelinien fortil højtliggende, men bøjer skraat nedad over Pectoralen; senere ret. 1ste Dorsalstraale dobbelt. Farven hvidlig gul med uregelmæssige brunsorte Pletter paa Hovedet og Legemets Overside (hos de yngre 3 større Rygpletter); en distinct mørk Plet under Øjet, og en lignende ved Roden af Pectoralen. Hannen med Analpapille. Størrelsen indtil 115 mm (Hun).*

M. B. 6. 1 D. 8—9 (7); 2 D. 18—20 (17); A. 13—15 (16); P. 17—19; V. 4; C. 5/12/5. Lin. lat. indtil 45.

lying off the Orkney and Shetland Islands, also the shores of the Faröe Islands, the coast of Iceland, and the Kara Sea.

On the coast of North America it would appear to be a common fish, occurring abundantly — and here too far south — in Massachusetts Bay, on the coast of New England, in lat. 41° N. (Goode and Bean, 1879).

Gen. Icelus, Kr.

Naturh. Tidsskr. 2 Række, 1 B. p. 261, Kbhvn. 1844—45 (1844).

Head comparatively compressed; fore part of body plump, hind part compressed; skin granulated in places, armed along the dorsal ridge with a row of osseous spines; sharp spines, too, along the lateral line; teeth (as in Centridermichthys) in jaws, on the vomer, and on the palatine bones; preoperculum armed; 2 dorsal fins; branchial membrane continuous on under surface of head.

8. **Icelus hamatus**, Kr. 1844.

Pl. I, fig. 8.

? *Cottus bicornis*, Reinh. Overs. 1839, Kgl. D. Vid. Selsk. Naturv. Math. Afh. 8 Del, p. LXXV, Kbhvn. 1841 (1839).
Icelus hamatus, Kr. Naturh. Tidsskr. 2 Række, 1 B. p. 253 and 261 (1844).
? *Centridermichthys bicornis*, Günth. Cat. Fish. Brit. Mus. vol 2, p. 172 (1860).
? *Icelus bicornis*, Gill, Proc. Acad. Nat. Sci. Philad. 1861, Suppl. p. 42 (1861).
Icelus furciger, Malm, Förh. Skand. Naturf. 9 Möte 1863, p. 410 (1863).

Diagnosis. — *Upper surface of body and head covered with rough granulations; spines along dorsal ridge and lateral line slightly denticulated; frequently a shorter row occurs along the anal, and spines, irregularly disposed on the sides. Length of head to total length as 1 to $3^1/_2$—4, eyes large and closely set, longitudinal diameter $^1/_3$ of the length of the head. Preoperculum with 4 spines, point of uppermost bifurcate. One pair of obtuse protuberances above the eyes, two pairs on the front. Lateral line in fore part of body high up the side, deflected downwards over the pectorals, from thence straight; first ray of first dorsal double. Colour whitish-yellow, on the head and upper surface of the body maculated with irregular brownish-black spots (in young examples 3 large dorsal spots); a distinct darkish spot under the eye, another at base of pectorals. The male with an anal papilla. Size reaching 115 mm (female).*

M. B. 6; 1 D. 8—9 (7); 2 D. 18—20 (17); A. 13—15 (16); P. 17—19; V. 4; C. 5/12/5. Lin. lat. up to 45.

Localit. fra Nordh. Exped. Jan Mayen; Spitsbergen.

	Stat. 223.	Stat. 224.	Stat. 366.
Beliggenhed.	Jan Mayen.	Jan Mayen.	Magdalenebay, Spitsbergen.
Dybde.	70 Favne (128 m).	95 Favne (174 m).	50 Favne (91 m).
Temp. paa Bunden.	— 0,6° C.	— 0,6° C.	— 1,0° C.
Bunden.	Sort Sand og Ler.	Sort Sand og Ler.	Mørkgraat Ler.
Datum.	1ste Aug. 1877.	1ste Aug. 1877.	17de Aug. 1878.
Antal Indiv.	1 Indiv.	1 Indiv.	1 Indiv.

Bemærkninger til Synonymien. Slægten *Icelus*, opstillet i 1844 af Krøyer (Naturh. Tidsskr. 2 Række, 1ste B.) for ovennævnte, hidtil eneste bekjendte Art, danner ved sine Rækker af skarpe Bentorne langs Ryggen og i Sidelinien blandt de arctiske Cottoider en Tilnærmelse til Slægten *Triglops*, med hvem den ogsaa har tilfælles det noget sammentrykte Hoved; i Tandbygning er den nærmest overensstemmende med *Centridermichthys*. Arten er udførligt beskreven allerede af Krøyer paa ovennævnte Sted, og herefter er dens Diagnose i Günthers Cat. Fish. Brit. Mus. vol. 2 (1860) affattet. Senere ere af flere Forfattere meddelte Bemærkninger vedrørende dens Optræden, saaledes ved Spitsbergen og de norske Kyster af Malmgren (Öfv. Kgl. Vet. Ak. Förh. 1864), af Esmark (Forh. Skand. Naturf. 10de Møde 1868), og af Collett (Norges Fiske 1874), ligesom Dr. Lütken har behandlet dens Synonymi etc. i 1876 (Vid. Medd. Naturh. Forh. Kbhvn. 1876. p. 380). Den er afbildet, (men ikke tilfredsstillende) i Gaimards Plancheværk til Corvetten la Recherche's Reise (Voyage Scand. Lap. etc. pl. 1). Endelig har Malm i 1877 (Göteb. och Boh. Fauna. p. 393) givet udførlig Beskrivelse af sin i 1863 (Forh. Scand. Naturf. 9de Möte 1863. p. 410) under Navn af *I. furciger* opstillede Art fra Bohuslen, der alene ved Tilstedeværelsen af en Række Bentorne ogsaa langs Analen adskiller sig fra *I. hamatus*, en Character, der dog ikke viser sig constant, men synes at være af ganske individuel Natur.

Bemærkninger til Beskrivelsen. De under Nordhavs-Expeditionen erholdte Individer havde følgende Maal:

	a. (Hun). Spitsbergen.	b. (Hun). Jan Mayen.	c. (Han). Jan Mayen.
Totallængde	43 mm	49 mm	61 mm
Længde uden Caudal	36 -	40 -	50 -
Hovedets Længde	11,5 -	15 -	19 -
Øjets Længdediameter	4 -	5 -	6 -

Flere af de ydre Characterer ere hos denne Art i en mærkelig Grad varierende, saaledes Hudens mere eller mindre rigelige Beklædning med Bentorne, de sidstes Bygning i Rækkerne langs Ryggen og i Sidelinien, ligesom ogsaa Sideliniens Længde; endelig er Straaleantallet temmelig lidet constant.

Locality (North Atl. Exped.): — Jan Mayen and Spitzbergen.

	Stat. 223.	Stat. 224.	Stat. 366.
Exact Locality.	Jan Mayen.	Jan Mayen.	Magdalene Bay, Spitzbergen.
Depth.	70 Fathoms. (128 m).	95 Fathoms. (174 m).	50 Fathoms. (91 m).
Temp. at Bottom.	— 0.6° C.	— 0.6° C.	— 1.0° C.
Bottom.	Black Sand and Clay.	Black Sand and Clay.	Dark-grey Loam.
Date.	1st Aug. 1877.	1st Aug. 1877.	17th Aug. 1878.
Numb. of Specim.	1 Indiv.	1 Indiv.	1 Indiv.

Remarks on the Synonymy. — Among the family of the Arctic Cottoids the genus *Icelus*, established, in 1844, by Kröyer, for the only species then and yet known, approximates the genus *Triglops* in the rows of sharp-pointed osseous spines extending along the dorsal ridge and lateral line, another salient character common to both being the somewhat compressed head. In the structure of the teeth it bears greatest resemblance to *Centridermichthys*. The first to give a full description of the species was Kröyer (*vide* list of synonyms), and from the above description Dr. Günther has compiled a diagnosis in Cat. Fish. Brit. Mus. vol. 2 (1860). Observations have been subsequently furnished by several authors on its occurrence, by Malmgren, off Spitzbergen and the shores of Norway (Öfv. Kgl. Vet. Ak. Förh. 1864); by Esmark (Forh. Skand. Naturf. 10de Møde 1868); and by Collett (Norges Fiske 1874); a paper by Dr. Lütken, treating of the synonomy of the species &c. appeared, too, in 1876 (Vid. Medd. Naturh. For. Kbhvn., 1876, p. 380). *Icelus hamatus* is figured, but somewhat imperfectly, in the series of plates to Gaimard's Narrative of the voyage of the "Recherche" (Voyage Scand. Lap. etc., pl. 1). Finally, Malm furnished i 1877 (Göteb. och Boh. Fauna, p. 393) a detailed description of the form from Bohuslen, described by him as *I. furciger*, which is distinguished from *I. hamatus* chiefly by a series of osseous spines along the anal fin, a character, however, which has not shown itself constant, but would seem to be altogether individual.

Descriptive Observations. — The individuals obtained on the Expedition measured as follows: —

	a. (female) Spitzb.	b. (female) Jan Mayen.	c. (male) Jan Mayen.
Total length	43 mm	49 mm	61 mm
Length exclusive of caudal	36 -	40 -	50 -
Length of head	11.5 -	15 -	19 -
Longitudinal diameter of eye	4 -	5 -	6 -

Many of the external characters in this species vary to a remarkable extent in different individuals, for instance, the space furnished with osseous denticles; the form and structure of these spinules in the rows along the dorsal ridge and the lateral line; the length of the lateral line; and the number of fin-rays.

Medens saaledes den Række af disse Bentorne, der løber langs Ryglinien, altid synes at strække sig uafbrudt lige til Roden af Caudalen, og det saaledes her er væsentlig de enkelte Tuberklers Bygning, der varierer med flere eller færre Tænder, med længere eller kortere Spidser, kan Sidelinien undertiden være manglende i sin sidste Del, uden at dette begrundes i Individets unge Alder. Medens 2 unge Hanner fra Stavangerfjorden i Norge (59°), optagne fra 100 Favnes Dyb i 1872, have Sidelinien fuldt udviklet lige til Haleroden med 35—37 Torne, skjønt Individernes Totallængde ikke er over 38 mm, er Sidelinien ufuldstændig hos alle de 3 større, der erholdtes under Nordhavs-Expeditionen; hos det mindste standser den henimod Slutningen af Analen, og har ialt 27 af disse benede Tuberkler; hos de 2 ældre, der have 33 Tuberkler, standser den noget bagenfor Analens Slutning. Det største Antal fandt Krøyer, der angiver 41—42 for sine Typ-Exemplarer, og Malm, som hos sin *I. furciger*, hvis Totallængde blot var 51 mm, fandt 45. I hvilken Grad disse benede Tuberkler selv variere i sin Bygning, har allerede Esmark gjort opmærksom paa i sine ovennævnte Bemærkninger i det 10de Naturforsker-Mødes Forhandlinger.

Intet af Nordhavs-Expeditionens 3 Individer havde Spor af den Række benede Tuberkler langs Analen, som ofte er tilstede hos Individer af Middelsstørrelse ved de scandinaviske Kyster, ligesom denne ogsaa fandtes (ifølge Dr. Lütken) hos det ene af Kröyers Typ-Exemplarer fra Grønland. En lignende Række udviste et Exemplar fra Spitsbergen, som jeg i 1879 havde Leilighed til at undersøge i Riks-Musæet i Stockholm. Disse Individer repræsentere Malms *I. furciger*.

At ligeledes den øvre gaffeldelte Torn paa Praeoperculum kan være ganske eller næsten udelt (hvilket er Regelen hos ganske unge Individer), har tidligere været gjort opmærksom paa. Dette var saaledes Tilfældet paa den ene Side af et af Nordhavs-Expeditionens større Individer.

Straaleantallet findes ligeledes at variere ikke ubetydeligt, hvad der fremgaar af nedenstaaende Fremstilling af de forskjellige Forfatteres Angivelser.

1 *D.*	2 *D.*	*A.*	
9	20	16	Grønland (Kr. 1844); Typ-Expl.
8—9	19—20	15—16	Spitsbergen 1861 (Malmgr. 1864).
8	18—19	14	Grønland (Malmgr. 1864).
9	17	13—14	Norge 1866—72 (flere Expl. C. 1874).
8	19	13	Norge 1866—72 (C. 1874).
9	19—20	14—15	(flere Expl. Lütken 1876).
9	20	15	Bohuslen 1861 (Malmgr. 1877).
8	18	13	Spitsbergen 1868 (C.).
8	20	15	Spitsbergen 1868 (C.).
7	19	13	Spitsbergen 1872 (C.).
8	19	15	Spitsbergen 1872 (C.).

The row of osseous spines along the mesial line invariably appearing to exend as a continuous series to the origin of the caudal fin, and the exceptional character of the armature in this region being chiefly displayed in the structure of the individual tubercles, which vary in the number of the teeth and the length of the points, the terminal part of the lateral line is sometimes wanting altogether, which cannot be accounted for by the immaturity of the individual. Two young male examples from the Stavanger Fjord, in Norway (in lat. 59° N.), taken at a depth of 500 fathoms, in 1872, had the lateral line fully developed to the root of the tail, number of spines 35—37; and yet the total length did not exceed 38 mm, whereas in all three of the larger specimens, obtained on the Expedition, the lateral line is more or less imperfect: in the smallest, furnished with 27 osseous spines, it breaks off a short distance from the termination of the anal; in the two maturer examples it has 33 tubercles, and terminates a little beyond the posterior extremity of the anal. The largest number of tubercles yet observed is 41—42, in Kröyer's typical specimens, and 45 in Malm's *I. furciger* (total length only 51 mm). The extent to which the tubercles vary in structure has been pointed out by Professor Esmark, in a paper read before the 10th General Meeting of Naturalists.

No one of the three specimens taken on the Expedition exhibited traces of the series of osseous tubercles along the anal fin frequently observed in half-grown examples from the shores of Scandinavia, and which, according to Dr. Lütken, occurs in one of Kröyer's typical specimens from Greenland. An example from Spitzbergen which I had the oppertunely of examining in 1879, in the Riks Museum at Stockholm, was furnished with a similar series. These individuals represent *I. furciger*, Malm.

That the upper spine on the preoperculum, commonly bifurcate, in some individuals occurs with little or no appearance of furcation, more particularly in the early stage of growth, has been noticed before. This distinction was observed in a specimen taken on the Expedition.

The very considerable variation in the number of the fin-rays is apparent from the subjoined table, comparing the formulae given by the different authors.

1 *D.*	2 *D.*	*A.*	
9	20	16	Greenland (Kr. 1844); typ. spec.
8—9	19—20	15—16	Spitzbergen, 1861 (Malmgr. 1864).
8	18—19	14	Greenland (Malmgr. 1864).
9	17	13—14	Norw. 1866—72 (sever. spec. C. 1874).
8	19	13	Norway 1866—72 (C. 1874).
9	19—20	14—15	(several specim. Lütken 1876).
9	20	15	Bohuslen 1861 (Malmgr. 1877).
8	18	13	Spitzbergen 1868 (C.).
8	20	15	Spitzbergen 1868 (C.).
7	19	13	Spitzbergen 1872 (C.).
8	19	15	Spitzbergen 1872 (C.).

Nordhavs-Expeditionens Individer havde følgende Straaleantal:

1 *D.* 8; 2 *D.* 19; *A.* 15. Spitsbergen 1878.
1 - 8; 2 - 20; - 15. Jan Mayen 1877.
1 - 8; 2 - 20; - 15. Jan Mayen 1877.

1ste Dorsal har saaledes 8 eller 9, sjelden 7 Straaler; af disse er den første altid kløvet til Grunden, et Forhold, der er ganske mærkeligt, og som jeg ikke hidtil har fundet omtalt. De øvrige ere alle enkelte. 2den Dorsal, der tæller 18—20, sjelden 17 Straaler, er højere, end 1ste Dorsal; omtrent den 6te Straale er den længste. Alle Straaler ere her enkelte. Analen, der har 13—15, eller hos enkelte Individer 16 Straaler, har omtrent den 8de Straale længst.

Pectoralerne have alle noget fri Spidser, især de nederste, der tillige, som det er Regelen hos de cottoide Fiske, ere noget fortykkede; den 7de eller 8de Straale fra neden af er den længste. Caudalen er tydeligt emargineret, med afrundede Hjørner.

Til Krøyers og Malmgrens detaillerede Beskrivelser af Arten kan yderligere føjes, at der, hvad allerede af Esmark er bemærket, hos uskadte Individer findes 3 særdeles fine Hudtrevler paa Hovedet. Den største af disse sidder ovenfor Øjets bagre Rand, og er fladtrykt, samt haandformig fryndset i Randen; de øvrige ere enkelte, korte Hudtrevler. Alle ere særdeles løstsiddende, og gaa tabte ved den mindste Berøring, hvorfor de i Regelen kun findes hos forholdsvis særdeles faa af de i Musæerne opbevarede Individer.

Medens fremdeles Bundfarven hos Individet fra Spitsbergen var temmelig lys, næsten hvidagtig, og viste de regulære 4 Tverpletter over Ryggen særdeles tydeligt, vare de i 1878 ved Jan Mayen erholdte Individer oventil saa rigeligt forsynede med brunsorte Smaapletter og Streger, at Bundfarven var næsten ganske skjult, og Tverpletterne kun utydeligt markerede. Dette tør maaske antages at staa i Forbindelse med de Bundforholde, under hvilke Individerne levede; ved Jan Mayen bestod Bunden af vulkansk sort Mudder, hovedsagelig af Lava; ved Spitsbergen var der Lerbund.

Udbredelse. *I. hamatus* hører til de i den arctiske Zone hyppigt optrædende Arter, og gaar (tilligemed *Cottus quadricornis*) sandsynligvis længere mod Nord, end nogen anden af de hidtil kjendte Cottoider. Fra Grønland er den oftere nedsendt til Musæet i Kjøbenhavn; i Vest-Grønland er den af den engelske Nordpol-Exped. (1875—76) fundet at være en af de almindeligste Fiske mellem 80 og 82° N. B., og gydefærdige Individer fandtes her i August. I Fjordene i Øst-Grønland er den af Germania- og Hansa-Expeditionen i 1869 fundet i 2 smaa Individer under 75° N. B.

I et temmelig stort Antal er den fremdeles indsamlet under de svenske Polar-Expeditioner 1861—72 ved Spitsbergen, hvor den neppe har manglet paa noget under-

Number of fin-rays in examples obtained on the North Atlantic Expedition: —

1 *D.* 8; 2 *D.* 19; *A.* 15. Spitzbergen 1878.
1 - 8; 2 - 20; - 15. Jan Mayen 1877.
1 - 8; 2 - 20; - 15. Jan Mayen 1877.

The first dorsal has accordingly, as a rule, 8 or 9 rays, rarely 7; the first ray is invariably furcate to the base, a feature truly remarkable, and which I have not met with mentioned in any description of the species; the rest are all simple. In the 2nd dorsal, the number of rays is 18—20, rarely 17; height greater than that of 1st; the 6th ray generally the longest; all rays in this fin simple. Anal furnished with 13—15, sometimes 16 rays; longest ray about the eighth.

Points of pectoral rays all somewhat detached, in particular the undermost, which, too, as is mostly the case with Cottoid fishes, are somewhat thick; the seventh or eighth counting from below, the longest. Caudal emarginate, with rounded edges.

A specific character not found enumerated in the detailed descriptions by Kröyer and Malmgren, but mentioned for the first time by Esmark, is the occurrence, on the head, of three exceedingly slender membranous filaments, or cirri. The largest of these, thin, compressed, and fringed along the edges, is located above the posterior margin of the eye; the rest are short, simple cirri. They are all of them most slenderly attached to the skin, the slightest touch sufficing to detach them, and hence but rarely observed on specimens preserved in museums.

The ground-colour in the specimen obtained off Spitzbergen was rather light, nay almost whitish, exhibiting with great distinctness the 4 transverse bands across the back, whereas the individuals obtained in 1878 on the coast of Jan Mayen were streaked and maculated to that extent with interjacent brownish-black stripes and spots as to conceal almost entirely the colour of the ground; and the transverse bands were very indistinct. The character of the bottom may possibly have had something to do with this; off the coast of Jan Mayen the bottom consists of black eruptive mud; off Spitzbergen of clay.

Distribution. — *I. hamatus* is a common species in the Arctic zone, and probably occurs (in company with *Cottus quadricornis*) further north than any other of the *Cottidæ* yet known. From Greenland specimens have been frequently sent to the Museum in Copenhagen; off the coast of West Greenland it was found on the English North Pole Expedition (1875—76) to be one of the fishes occurring in greatest abundance between lat. 80°—82° N., and individuals about to spawn were met with here in the month of August. On the eastern coast of Greenland it was taken on the Germania and Hansa Expedition, 1869, in lat. 75° N.

A considerable number, too, were obtained on the Swedish Expeditions in 1861 and 1872, off Spitzbergen; indeed it can hardly fail to have been observed in every

søgt Punkt omkring denne Øgruppe. Ogsaa her fandtes rognfulde Individer i August Maaned. Ved Jan Mayen er den hidtil blot erholdt under Nordhavs-Expeditionen. Den findes ikke omtalt fra Island, men optræder langs Norges Nord- og Vestkyst lige ned i Kattegat under 58° N. B., altid paa det noget dybere Vand (ikke under 20 Favne). Et enkelt Individ (*I. furciger*, Malm) er fundet paa den svenske Kyst (Gullmarfjärden) ved Bohuslen i 1861.

Ved Americas Kyster er den hidtil ikke omtalt søndenfor Grønland.

well investigated locality there. Examples having the abdomen distended with roe also occurred there in August. Off the coast of Jan Mayen, the only individuals hitherto observed were those taken on the Expedition. The species is nowhere mentioned as occurring on the shores of Iceland; it is met with, however, along the entire line of the Norwegian coast, extending as far south as the Cattegat, in lat. 58° N., invariably at some depth (not less than 20 fathoms). A solitary example (*I. furciger*, Malm) was observed off Bohuslen in 1861.

On the shores of North America, it is not mentioned as extending further south than Greenland.

Gen. Triglops, Reinh.

Overs. 1829—30, Kgl. D. Vid. Selsk. Nat. Math. Afh. 5 D. p. LII, Kbhvn. 1832 (1829—30).

Hovedet af middels Størrelse, bedækket af en granuleret Hud: Kjæverne spinkle. Praeoperculum svagt væbnet, Operculum uden Torne. Sidelinien med Benplader: Legemet nedenfor denne bedækket af skraatløbende, bagtil tandede Hudfolder. Tænder i Kjæverne og paa Vomer. 2 adskilte Dorsaler. Pectoralernes Straaler ere nedtil næsten fri, og noget forlængede.

9. Triglops pingelii, Reinh. 1838.

Pl. I. Fig. 9—10.

Triglops pingelii, Reinh. Kgl. D. Vid. Selsk. Nat. Math. Afh. 7 Del p. 114 og p. 118 (1838).
Triglops pleurostictus, Cope, Proc. Acad. Nat. Sci. Phil. 1865, p. 81, Noten (1865).

Diagn. *Hovedet indeholdes omtr. 3¾ Gange i Totallængden. Snuden kort; Øjnene store, indeholdes ikke fuldt 3 Gange i Hovedlængden. Praeoperculum har 4 svage Torne. Legemet ovenfor Sidelinien granuleret, og med en Række Bentorne langs Grunden af Dorsalerne. Sidelinien højtliggende, med en Sænkning under 1ste Dorsal. Sidernes tandede Hudfolder særdeles talrige. Farven blegt hvidgul med brunsorte Tverpletter, hvoraf 4 ere større, eller med afbrudte uregelmæssige Længdepletter. Hannen har en lang Analpapille. Størrelsen indtil 200 mm (Hannen).*

M. B. 6. 1 D. 10—12 (13); 2 D. 24—25 (23 ell. 26); A. 24—25 (23—26); P. 17—21; V. 4; C. 10/12/10. Lin. lat. 47—49 (45—46).

Gen. Triglops, Reinh.

Overs. 1829—30, Kgl. D. Vid. Selsk. Nat. Math. Afh. 5 D. p. LII, Kbhvn. 1832 (1829—30).

Head of moderate length, enveloped in a rough, granulated skin; jaws slender, unarmed. Preoperculum slightly armed; operculum without spines. Lateral line with osseous plates. Body covered below with oblique membranous folds, dentate along the posterior margin; dorsals 2, disconnected. Teeth in jaws and on vomer. Pectoral rays in lower part of fin almost free, and somewhat elongated.

9. Triglops pingelii, Reinh. 1838.

Pl. I, fig. 9—10.

Triglops pingelii, Reinh.; Kgl. D. Vid. Selsk. Nat. Math. Afh. 7 Del. p. 114 & p. 118 (1838).
Triglops pleurostictus, Cope, Proc. Acad. Nat. Sci. Phil. 1865, p. 81, Note (1865).

Diagnosis. — *Length of head to total length as 1 to 3¾; snout short. Eyes large, longitudinal diameter not quite ⅓ of the length of the head. Preoperculum with four slender spines. Body above lateral line granulated, a series of osseus spines extending along base of dorsals. Lateral line high up the side, bending downwards under first dorsal. The dentate membranous folds exceedingly numerous. Colour pale whitish-yellow, relieved with transverse spots of brownish-black, 4 larger than the rest, or with disrupted longitudinal patches, irregulary disposed. The male has a long anal papilla. Length reaching 200 mm (male).*

M. B. 6. 1 D. 10—12 (13); 2 D. 24—25 (23—26); A. 24—25 (23—26); P. 17—21; V. 4; C. 10/12/10. Lin. lat. 47—49 (45—46).

Localit. fra Nordh. Exped. Jan Mayen; Spitsbergen.

	Stat. 223.	*Stat.* 237.	*Stat.* 366.
Beliggenhed.	Jan Mayen.	Jan Mayen.	Magdalenebay, Spitsbergen.
Dybde.	70 Favne (128 m).	263 Favne (481 m).	50 Favne (91 m).
Temp. paa Bunden.	— 0,6° C.	— 0,3° C.	— 1,0° C.
Bunden.	Sort Sand og Ler.	Brunt Sand og Ler.	Mørkgraat Ler.
Datum.	1ste Aug: 1877.	3die Aug. 1877.	19de Aug. 1878.
Antal Indiv.	1 Indiv.	1 Indiv.	1 Indiv.

Bemærkninger til Synonymien. Slægten *Triglops* opstilledes af Reinh. sen. allerede i Overs. for 1829—30. Kgl. D. Vid. Selsk. Nat. Math. Afh. 5 B. p. LII (Kbhvn. 1832) efter et Exemplar fra Grønland; men først i 1838 blev den i samme Tidsskrifts 7de Bind meddelt sit Artsnavn. Den viser i flere Henseender en Tilnærmelse til Slægten *Trigla*, saaledes i Tandbygningen, Hovedets Form, de fintandede Skraalinier nedad Legemets Sider, og de nedtil stærkt fri Pectoralstraaler.

T. pingelii er den eneste hidtil sikkert bekjendte Art af denne Slægt. Ligesom det var Tilfældet med *Centrid. uncinatus*, blev den af Reinh. kun ganske kort characteriseret; derimod gav Krøyer i 1844 (Naturh. Tidsskr. 2den R. 1ste B.) efter det i Kbhvns. Musæum foreliggende Materiale en udførligere Diagnose af saavel Slægt, som Art, og efter disse ere Günthers Diagnoser i Cat. Fishes Brit. Mus. vol. 2 (1860) affattede, da endnu intet Indiv. forelaa i British Museum. I 1864 erholdt Malmgren et Individ ved Spitsbergen; senere er den gjentagne Gange bleven kortelig omtalt fra Norge, ligesom Dr. Lütken har nærmere omhandlet de i Musæet i Kbhvn. opbevarede Exemplarer fra Grønland i Vid. Medd. Naturh. Foren. Kbhvn. for Aaret 1876.

Af Kröyer er den bleven afbildet i Gaimards Plancheværk (Voy. Scand. Lap. etc. 1838—40, Poiss. pl. 1), men denne Afbildning er i flere Henseender ufuldkommen. En udførligere Beskrivelse af *T. pingelii* er hidtil intetsteds bleven leveret.

Beskrivelse. *Legemsbygning.* Hele Legemet er oventil, ligesom Hovedet, tæt beklædt med fine Granulationer, og nedenfor Sidelinien med tandede Hudfolder; blot Gjællemembranen er nøgen. Pectoralerne og Øjnene ere forholdsvis særdeles store. Hannerne ere kjendelige ved sin overordentlig store Analpapille, der ved Grunden omtrent har en Lindsediameters Tykkelse, og er rettet noget fremad; dens Længde udgjør omtrent en Orbitaldiameters Bredde. Halen er temmelig lang og uddragen, og Haleroden er forholdsvis lav.

Locality (North Atl. Expedition): — Jan Mayen and Spitzbergen.

	Stat. 223.	*Stat.* 237.	*Stat.* 366.
Exact Locality.	Jan Mayen	Jan Mayen.	Magdalene Bay, Spitzbergen.
Depth.	70 Fathoms. (128 m).	263 Fathoms (481 m).	50 Fathoms (91 m).
Temp. at Bottom.	— 0,6° C.	— 0,3° C.	— 1,0° C.
Bottom.	Black Sand and Clay.	Brown Sand and Clay.	Dark-grey Loam.
Date.	1st Aug. 1877.	3rd Aug. 1877.	19th Aug. 1878.
Numb. of Specim.	1 Indiv.	1 Indiv.	1 Indiv.

Remarks on the Synonymy. — The genus *Triglops* was first established by Reinhardt sen., in Kgl. D. Vid. Selsk. Nat. Math. Afh. Overs. for 1829—30, 5 B. p. LII (Kbhvn. 1832), from a specimen taken on the coast of Greenland; it did not however receive its specific name before 1838, in the 7th volume of the said Journal. This genus approximates in many of its characters the genus *Trigla;* for instance, in the dentition, the form of the head, the oblique serrate lines traversing the sides of the body, and in the pectoral rays being to a great extent free.

T. pingelii is the only species of this genus with certainty known to have been observed. As had been the case with *Centrid. uncinatus*, its generic characters were but briefly set forth by Reinhardt sen.; on the other hand, Kröyer, in 1844, from materials in the Zoological Museum at Copenhagen, gave a detailed diagnosis both of the genus and the species, which is the source whence Günther has furnished his diagnosis in Cat. Fishes Brit. Mus. vol. 2 (1860), as the British Museum had no example of the species. In 1864 Malmgren obtained a specimen from the coast of Spitzbergen; since then it has been repeatedly mentioned as occurring off the Norwegian coast; and in 1876 Dr. Lütken treated of the specimens preserved in the Zoological Museum of Copenhagen in Vid. Medd. Naturh. Foren. Kbhvn. for that year.

The species has been figured by Kröyer in one of the plates to Gaimard's work (Voy. Scand. Lap. etc. 1838—40; Poiss. pl. 1); but this representation is in several respects faulty. A detailed description of *T. pingelii* has not as yet been furnished.

General description. *Structure of the Body.* — Body, above, and head, closely studded with minute granulations; dentate membranous folds below the lateral line, branchial membrane only smooth. Pectorals and eyes comparatively large. Male individuals easily distinguished by the remarkable size of the anal papilla, which projects slightly forward; its thickness at base about equal to the transverse diameter of the lens, and its length, to the diameter of the orbit. Tail rather long and elongate, slender at base.

Hovedet har en forholdsvis kort, men temmelig tilspidset Snude, og den tæt chagrinerede Hud er fast beklædende Craniet; tykke Læber, som hos *Cottus*, *Centridermichthys* og *Gymnacanthus*, findes ikke, og Kjæverne synes derfor temmelig spinkle. I Totallængden indeholdes Hovedets Længde omtr. $3^3/_4$ Gange.

Øjnene ere særdeles store, og Orbita's Diameter længere, end Snudens Længde. Hos det største af de under Expeditionen erholdte Individer (Totall. 108^{mm}) indeholdes Snuden næsten 2 Gange i Længden af Orbita, men hos de yngre er Øjendiameteren noget mindre. I Hovedlængden indeholdes Øjet fra $2^3/_4$ til 3 Gange. Interorbitalrummet er distinct, og har en Bredde, der omtrent er lig Lindsens Diameter.

Tænder ere tilstede i Mellem- og Underkjæven, samt paa Vomer, men ere yderst fine; Palatinbenene er tandløse.

2 Par Næsebor findes; det øverste Par er beliggende temmelig nær Orbitalranden, det nederste omtrent midt mellem denne og Randen af Overkjæven. Kjæverne ere omtr. af samme Længde; hos enkelte Ind. synes Underkjæven at være ubetydeligt længere, end Overkjæven.

Gjællestraalerne ere 6, eller (ifølge Lütken og Kröyer) undtagelsesvis 7 i Antal.

Huden. Hudtraade paa Hovedet, saaledes som hos flere af de øvrige Cottoider, har jeg ikke kunnet opdage hos denne Art. Derimod strækker sig (tydeligst hos de yngre Individer) rundt Orbita en tæt Række smaa Hudpapiller (omtrent som hos Gobierne); nedtil støder denne Kreds mod en horizontal Række, der strækker sig fra Næseborene til den øvre Rand af Praeoperculum.

Hovedets Væbning er mindre stærkt udviklet, end hos de fleste øvrige beslægtede Former. Praeoperculum er tandet, men Tænderne ere lave, og ikke synderligt fremtrædende af Huden. Deres Antal er 4, og deres Stilling er den hos Cottoiderne almindelige, idet den øverste peger opad og bagud, de øvrige nedad. Operculum er uvæbnet, og ender med en afrundet Flig.

Den skarpe og bagudrettede Torn, der hos de fleste cottoide Fiske findes paa hver Side af Snuden, støttende sig til Næsebenene, er ogsaa tilstede hos *Triglops;* hos en Unge fra den norske Kyst var den ene af dem kløvet i Spidsen. Ungerne have fremdeles paa Panden de sædvanlige 2 Par skarpe Bentorne, men disse ere næsten umærkelige hos de ældre.

Hovedets chagrinartede Beklædning strækker sig hos ældre Individer ud over Øjets øvre Del, men mangler altid paa Hovedets Underside; hos smaa Unger, hvis Totallængde er under 30^{mm}, ere dog endnu Gjællelaagene næsten ganske glatte.

Det egentlige Legeme har alene det ubetydelige Parti af Bugen mellem Ventralerne og Anus glat; ovenfor Laterallinien er Legemet granuleret, ligesom Hovedet, og nedenfor denne, samt paa Struben, forsynet med de ejendommelige skraatløbende, bagtil tandede Hudfolder.

Head furnished with a rather short, but comparatively sharp-pointed snout, and the rough granulous skin firmly attached to the cranium; lips not thick and fleshy (as in *Cottus*, *Centridermichthys*, and *Gymnacanthus*), giving to the jaws a somewhat slender appearance. Length of head to total length about as 1 to $3^3/_4$.

Eyes remarkably large, the diameter of the orbit exceeding the length of the snout. In the largest specimens obtained on the Expedition (total length 108^{mm}), the diameter of the orbit is to the length of the snout almost as 2 to 1, in the younger examples a trifle less. Diameter of eye to length of head as 1 to $2^3/_4$—3. Interorbital space distinctly obvious, breadth about equal to diameter of lens.

Teeth in intermaxillary and lower jaw, and on vomer, but exceedingly minute; none on the palatine bones.

Two pairs of nostrils, the upper pair placed in close proximity to the margin of the orbit, the lower about midway between the margin of the orbit and that of the upper jaw. Length of jaws about equal; in some examples the lower jaw appears to protrude slightly beyond the upper.

Branchiostegals 6, or (according to Kröyer and Lütken) exceptionally 7.

Skin. — Of membranous filaments, such as occur in divers of the other *Cottidæ*, I have not been able to detect any vestige; but, encircling the orbits (and most conspicious in young individuals), is an annular series of minute warty protuberances (much the same as in the Gobioids); below, this ring is met by a horizontal series, extending from the nostrils to the upper margin of the preoperculum.

Armature of head less fully developed than in most of the other allied forms; preoperculum dentate, the teeth however depressed, and but slightly projecting above the skin; number, 4, position and arrangement that common to the Cottoids, the uppermost oblique, pointing upwards and backwards, the rest downwards. No arming is observed on the operculum, which terminates in a membranous flap.

The sharp spine, inclining backwards, which in most Cottoid fishes occurs on either side of the snout, projecting from the nasal bones, is also observed in *Triglops;* a young example, taken on the Norwegian coast, had one of these spines furcated at the point. In young individuals the front is furnished with the normal number of osseous spines (2 pairs); these are hardly perceptible in adults.

The rough, granulous skin of the head extends, in mature individuals, beyond the upper part of the eye, the under surface of the head is invariably smooth; in very young examples (total length under 30^{mm}), however, the opercles occur as yet smooth.

Of the body proper a very small portion comparatively is smooth — that on the abdomen, extending between the ventrals and the anus; above the lateral line, the whole of the body is rough with granulations, as also the head; the region below it, and the throat, furnished with the characteristic oblique and dentate membranous folds.

Sidelinien dannes af en sammenhængende Række tandede Benplader, hvis Antal, der svarer til Hvirvelantallet, er 47—49, eller undertiden et Par færre; den ligger i sit hele Løb noget ovenfor Legemets Midtlinie, gjør en ubetydelig Sænkning ned under 1ste Dorsal, men hæver sig atter, og løber herefter lige ud mod Caudalen. Fra Unger af *Icelus hamatus*, hvor de Udvoxedes Characterer endnu ikke ere fuldt udviklede, kunne ligestore Unger af *Triglops* kjendes ved Sideliniens Løb, idet denne hos *Icelus* danner en opad convex, hos *Triglops* en opad concav Bue under 1ste Dorsal.

Ovenfor Sidelinien strækker sig en Række Bentorne langs hele Grunden af Dorsalerne, der taber sig omtrent ved Midten af 2den Dorsal. Hos de yngre Individer ere disse Bentorne højere og skarpere, end hos de ældre, hvor de tildels ere lidet fremtrædende af Hudens chagrinerede Parti.

De skraatløbende Hudfolder danne oprindelig Fortsættelser af Sideliniens Benplader, og bedække fuldkommen Legemets Sider nedenfor denne. Ikke altid fortsætter den samme Hudfold sig uden Afbrydelse lige ned til Ventrallinien, men nye af forskjellig Længde begynde og ophøre næsten overalt, saaledes at deres Antal nedad bliver langt større, end Benpladernes i Sidelinien. Enhver af disse Hudfolde er i sin bagre Rand fint tandet; de gaa lige ud til Caudalen, og med lignende Hudfolder er ligeledes Struben beklædt.

Det Tidspunkt, da disse characteristiske Tverstriber, samt Tornerækkerne udvikle sig hos Ungerne, synes at være noget varierende. Sandsynligvis blive Hannerne tidligere væbnede, end Hunnerne. Saaledes har jeg undersøgt Unger (fra Norge), der sandsynligvis have været Hanner, hvis Totallængde har været mellem 26 og 30mm, og som allerede havde saavel Tverstriberne, som Tornerækkerne antydede eller i Frembrud; derimod var et andet Individ fra Spitsbergen (erholdt under den svenske Expedition i 1864), hvis Totall. var 37mm, og som jeg i 1879 havde Lejlighed til at undersøge, endnu glat overalt; Sidelinien var her synlig som en Række hvidagtige, parvis stillede Papiller, der standsede før Slutningen af 2den Dorsal, men intet Spor viste sig af Tverstriberne; den øvre Tornerække var ligeledes blot antydet ved bløde Papiller, der endnu knapt vare ossificerede eller væbnede. Dette sidste Individ var sandsynligvis en Hun.

Finnerne. De 2 Dorsaler ere adskilte ved et Mellemrum, der dog ikke plejer at være større, end Lindsens Diameter. Alle Straaler ere spinkle og skjøre som Glas, saaledes at Finnerne ofte ere mere eller mindre defecte. 1ste Dorsal er højere, end 2den, og har 10 til 13 Straaler; 2den Dorsal har 23 til 26 Straaler. Analen, der har den samme Længde og Bygning, som 2den Dorsal, har det samme Straaleantal; som denne sidste Finne; begge disse slutte i betydelig Afstand fra Caudalen. Pectoralernes Straaleantal ligger mellem 17 og 21. Caudalen, der næsten er ret afskaaret i sin bagre Rand, eller svagt emargineret, har, foruden paa hver Side et Antal korte Støttestraaler,

The lateral line consists of a continuous series of dentate osseous plates, corresponding in number (47—49, sometimes one or two fewer) with the vertebræ; it extends, throughout its entire length, a little above the mesial line, bending slightly downwards under the first dorsal, from whence, after regaining its original position, it passes straight to the caudal fin. Young individuals of *Icelus hamatus*, which have not as yet the adult characters fully developed, may be readily distinguished from young examples of *Triglops* by the upward sweep of the lateral line under the first dorsal, which in *Icelus* is convex, in *Triglops* concave.

Above the lateral line is a series of osseous spines, extending along the base of both dorsals; about the middle of the second it ceases however to be obvious. In young examples these spines are longer and sharper than in adults, which have them in some cases but very sligtly elevated above the granulous surface of the skin.

The oblique membranous folds are at first continuations of the osseous plates of the lateral line, covering the whole of both sides of the body beneath it. The same fold does not always extend uninterruptedly to the ventral line, others commencing and breaking off almost everywhere, and hence the total number of folds greatly exceeds that of the osseous plates on the lateral line. Each of these membranous folds is dentate, or rather serrate along its posterior margin; they extend to the caudal fin; similar transverse folds cover the throat.

The exact stage of growth at which these characteristic transverse stripes and series of osseous spines begin to develop would appear to vary. Probably males acquire armature earlier, than females. I have examined young individuals (from Norway), most likely males, having a total length of between 26 and 30mm, in which both the transverse stripes and the series of spines were either rudimentary or in course of development, whereas an example from the coast of Spitzbergen (taken on the Swedish Expedition in 1864), total length 37mm, which I had an opportunity of examining in 1879, was as yet perfectly smooth. In that specimen, the lateral line was obvious as a row of whitish papillæ, terminating near the extremity of the 2nd dorsal; but of transverse stripes no vestige was perceptible; also the upper row of spines in the rudimentary stage was marked out with soft and tumid papillæ, which as yet exhibited little or no trace of arming. This individual was probably a female.

Fins. — The two dorsals separate; space between them generally not greater than the diameter of the lens; all the rays slender, and brittle as glass; hence the fins themselves, in the great majority of examples, are in a more or less mutilated condition. Height of first dorsal exceeds that of second; number of rays in former 10—13, in latter 23—26. The anal fin, length and structure corresponding to that of second dorsal, also furnished with 23—26 rays; both these fins placed at a considerable distance from caudal; number of rays in pectorals varying from 17 to 21. Posterior margin of caudal square, furnished on either side with a number of short auxiliary

11, eller oftest 12 ordinære Straaler, der i Spidserne ere kløvede. Ventralstraalernes Tælling er forbunden med nogen Vanskelighed paa Grund af Straalernes Tæthed og dybe Kløvning; Antallet er 4. Hos det største af de under Expeditionen erholdte Han-Individer fortsætter Membranen sig som en bred Bræm langs Ydersiden af denne Finne.

De under Nordhavs-Expeditionen erholdte Individer havde følgende Straaleantal:

a. (Hun) *1 D.* 12; *2 D.* 24; *A.* 24; *C.* 10/12/10; *P.* 21; *V.* 4.
b. (Han) — 10; — 24; - 24; - 10/12/6; - 18; - 4.
c. (Hun) — 10; — 26; - 26; - 10/12/10; - 21; - 4.

Farvetegning. Denne er temmelig varierende, og synes at forandre sig noget under Væxten. Medens de unge Individer oftest have paa den hvide eller svagt gulagtige Bundfarve 4 større, skarpt begrændsede Pletter, hvortil senere støde andre og mindre nedad Legemets Sider, blive disse Pletter hos de større Individer opløste til korte langsløbende eller skraa Baand, der kunne være afbrudte, og delte i mindre Pletter. Denne sidste Farvetegning have begge de under Expeditionen erholdte Hanner, medens Hunnen har den mere overensstemmende med Ungernes. Af Finnerne have Dorsalerne, Pectoralerne og Caudalen tydelige Tverbaand.

Størrelse. De største Individer, der hidtil ere fundne af denne Art, opbevares i Musæet i Kjøbenhavn, og ere fra Grønland. Ifølge Dr. Lütken (l. c. p. 378) har af disse en Han naaet en Totallængde af 145 mm, en Hun endog 200 mm, og denne Forskjel mellem Kjønnene synes at være gjennemgaaende.

De 3 under Expeditionen erholdte Individer havde følgende Maal:

	a. Hun. Jan Mayen.	*b.* Han. Spitsb.	*c.* Hun. Jan Mayen.
Totallængde	70 mm	90 mm	108 mm
Længden uden Caudal .	60 -	79 -	93 -
Hovedets Længde . .	20 -	24 -	29 -
Øjets Diameter . . .	7 -	7,5 -	11 -

De ved de norske Kyster hidtil fundne Individer have i Regelen været smaa, og deres Totallængde aldrig overskredet 102 mm.

Levemaade og Føde. Som alle Arter af denne Gruppe er *Triglops pingelii* henvist til at leve nærved eller umiddelbart paa Bunden, hvilket allerede fremgaar af Pectoralernes Bygning, hvis nedre Straaler ere mere eller mindre fri. Hos unge Individer er det dog blot Straalernes yderste Spidser, der rage ud over Membranen; men Indsnittet mellem dem tiltager med Alderen, og hos de udvoxede ere de nederste Straaler skilte næsten til Grunden, de nærmest paafølgende noget mindre. Ialt deltage 7—8 Straaler heri, og samtidig ere disse beklædte med en tykkere Hud, og tillige livligere farvede, end de øvrige 13—14, ligesom de øverste af dem ere noget længere, end de tilgrændsende normale Straaler. Herved fremkommer en Tilnærmelse til

spines, exclusive of 11, or more frequently 12 ordinary spines, all of which are cleft at the points. The numbering of the ventral rays is attended with some dificulty, in consequence of the extreme closeness and deep furcation of the rays; they are 4 in number. In the largest of the male specimens obtained on the Expedition the membrane extends as a wide border along the outer margin of this fin.

Number of rays in the specimens taken on the North Atlantic Expedition: —

a. (female) *1 D.* 12; *2 D.* 24; *A.* 24; *C.* 10/12/10; *P.* 21; *V.* 4.
b. (male) — 10; — 24; - 24; - 10/12/6; - 18; - 4.
c. (female) — 10; — 26; - 24; - 10/12/10; - 21; - 4.

Colour. — The marking is subject to considerable variation in different individuals, and changes, too, apparently, as the growth progresses. Young individuals are generally characterised by having on the whitish ground-colour, or rather whitish with a faint tinge of yellow, 4 comparatively large and well-defined spots, meeting other and smaller macules disposed down the sides of the body, whereas in more mature examples these spots break up, appearing as a number of horizontal or oblique bands, sometimes disrupted into smaller spots. The latter marking distinguishes both of the male specimens taken on the Expedition; the female bore in this respect a greater resemblance to the young individuals. Well-defined transverse bands on the dorsals, the pectorals, and the caudal.

Dimensions. — The largest individuals of this species hitherto met with are preserved in the Zoological Museum at Copenhagen; they were sent from Greenland. According to Dr. Lütken, one male has attained a total length of 145 mm, a female 200 mm even; and this difference in size between the sexes would appear to be characteristic.

Measurements of the three specimens obtained on the Expedition: —

	a. Female. Jan Mayen.	*b.* Male. Spitzb.	*c.* Female. Jan Mayen.
Total length . . .	70 mm	90 mm	108 mm
Length excl. of caudal	60 -	79 -	93 -
Length of head . .	20 -	24 -	29 -
Diameter of eye . .	7 -	7.5 -	11 -

Most of the individuals hitherto observed on the Norwegian coast have been small, their total length not exceeding 102 mm.

Habits and Food. — In common with all other species of this Arctic group, *Triglops pingelii* occurs immediately on, or in close proximity to, the bottom, a fact necessarily involved in the structure of the pectorals, the lower rays being to a greater or less extent free. In young individuals, however, the extreme points only are found to have pierced the membranous integument; but the incision continues to deepen with the growth, and in mature examples the lowermost rays are cleft almost to the base, those next above them to a somewhat less extent. This characteristic feature is shared by 7—8 of the rays, which have a thicker integument and a deeper colour than the rest (13—14); moreover, the uppermost are of somewhat

det Krybe- og Føleorgan, som er højest udviklet hos Slægten *Trigla*, hvor Straalernes absolute Frihed tilsteder en Bevægelse af denne Finnedel i alle Retninger, saaledes at disse Fiske i Virkeligheden kunne krybe henad Havbunden, medens Straalernes Spidser under famlende Bevægelser nedstikkes i Gruset.

Triglops pingelii forekommer blot paa det noget dybere Vand, og gaar neppe højere op, end til 16—20 Favne. Den største Dybde, hvor denne Art hidtil er fundet, beboedes af den store Han fra Nordhavs-Expeditionen, der optoges paa 263 Favnes Dyb. Alle de under denne Expedition erholdte Individer bleve fundne i den iskolde Area, hvor Temperaturen paa Bunden var under 0° C.

I Ventrikelen af det største Individ, en Han fra Jan Mayen, fandtes blot et middelstort Exemplar af *Themisto libellula*, Mandt; hos den mindre Hun (fra Spitsbergen) Dele af en Annelide *(Polynoë)*, samt af en Crustacé. En fuldt udviklet Hun fra Gjæsvær ved Nordcap, med en Totallængde af 102^{mm}, det største Individ af denne Art, der hidtil er fundet ved Norges Kyster, indeholdt blot Levninger af Crustaceer, nemlig Dele af en *Hippolyte* og af en *Pandalus*.

Legetiden foregaar maaske om Vinteren, idet Generationsorganerne hos Expeditionens Individer ikke for Øjeblikket befandt sig i fuld Udvikling. Ovarierne hos Hunnen indeholdt saaledes endnu uudviklede Æg; Antallet af disse var i hvert Ovarium mellem 250 og 300, saaledes ialt 5—600.

Udbredelse. *Tr. pingelii* har Udbredelse fælles med de fleste øvrige europæisk-arctiske Cottoider, og forekommer sandsynligvis overalt paa passende Localiteter mellem Grønland, Novaja Zemlja, Island, Færøerne, og Norges Kyster. Ved Grønland synes den ikke at være sjelden, og flere Exemplarer ere herfra indløbne til Musæet i Kjøbenhavn, ligesom den i August 1876 erholdtes under den engelske Nordpol-Expedition i Vest-Grønland under 79° 29′ N. B.

I Nord-America gaar den, ligesom et Flertal af rent arctiske Fiske, forholdsvis langt længere mod Syd, end i Europa, og er saaledes erholdt i Massachusetts Bay udenfor New England under 42° N. B. Under de svenske Expeditioner til Spitsbergen er den funden ved denne Øgruppe allerede i 1861; ifølge Dr. Lütken er den ligeledes funden ved Færøerne og Island, og Nordhavs-Expeditionen har, som ovenfor nævnt, erholdt den ved Jan Mayen. Endelig forekommer den langs Norges Kyster fra Varangerfjorden ned til Stat eller Christiansund ($61^1/_2$°), men synes intetsteds her at forekomme i noget betydeligt Antal.

greater length than the adjacent normal rays. In this peculiarity of structure an approximation is shown to the motory and sensory organ, developed most in the genus *Trigla*; the rays in that genus being entirely free, this part of the fin can be moved about in all directions, and, on the points of the rays being pressed into the gravel, the fish appears to creep over the bottom.

Tr. pingelii occurs in comparatively deep water only, never ascending nearer the surface than 16—20 fathoms. The greatest depth at which the species has hitherto been observed is that from which the large-sized male specimen was taken on the North Atlantic Expedition — 263 fathoms. All the examples obtained on the Expedition inhabited the cold area, where the temperature at the bottom was below 0° C.

In the ventricle of the largest specimen, a male from Jan Mayen, was found only a moderate-sized example of *Themisto libellula*, Mandt; in that of the smallest, a female (from Spitzbergen), fragments of an Annelid *(Polynoë)* and of a crustacean. The stomach of a full-grown female, from Gjæsvær, near the North Cape, total length 102^{mm}, the largest example of this species hitherto taken in Norway, contained only fragments of crustaceans, viz. of a *Hippolyte* and of a *Pandalus*.

The spawning-season is perhaps in winter, since the generative organs in the specimens taken on the Expedition were not then in a fully developed condition. The ovaries, too, contained immature ova; the number in each ovary was from 250 to 300, in both together from 500 to 600.

Distribution. — *Triglops pingelii* has the range common to most of the other Arctic *Cottidæ* in Europe, occurring probably in all favourable localities between Greenland, Novaja Zemlja, Iceland, the Faröe Islands, and the coast of Norway. On the coast of Greenland, it would appear to be not a rare species, and examples from that region have repeatedly been sent to the Zoological Museum in Copenhagen; it was taken, too, in 1876, on the English North Pole Expedition, off the west coast of Greenland, in lat. 79° 29′ N.

On the shores of western North America it occurs, in company with a large majority of true Arctic forms, comparatively farther south than in Europe, having been observed in Massachusetts Bay, off the coast of New England, in lat. 42° N. On the Swedish Expeditions to Spitzbergen, in 1861, it was obtained off that group of islands; according to Dr. Lütken, it has also been met with off the shores of the Faröe Islands and the coast of Iceland; and on the North Atlantic Expedition, as previously stated, it was met with on the coast of Jan Mayen. Finally, it occurs along the Norwegian coast, from the Varanger Fjord as far south as Stat or Christiansund (61° 30′ N.), but nowhere, it seems, as a common species.

Fam. Agonidae.

Gen. Agonus, Schneid.

Bloch, Syst. Ichth., (ed. Schneid.), p. 104 (1801).

10. Agonus decagonus, Schneid. 1801.

Pl. II. Fig. 11—12.

† *Cottus cataphractus*, Fabr. Fauna Groenl. No. 112, p. 155 (1780).
Agonus decagonus, Schneid. Bloch, Syst. Ichth. p. 105 (1801).
Aspidophorus decagonus, Cuv. & Val. Hist. Nat. Poiss. tom. 4, p. 223 (1829).
Aspidophorus spinosissimus, Kr. Naturh. Tidsskr. 2 Række, 1 B. p. 250 (1844).
Aspidophorus malarmoides, Deslongch. Mém. Soc. Lin. Norm. tom. 9, p. 167 (1853).
Leptagonus spinosissimus, Gill, Proc. Acad. Nat. Sci. Philad. 1861, p. 167 (1861).
Archagonus decagonus, Gill, Proc. Acad. Nat. Sci. Philad. (*teste* Lütk.)

Diagn. *Legemet smalt, dets største Bredde indeholdes 8, Hovedets Længde 5 Gange i Totall. Det gjennemsnitlige Antal af Skjolde er: mellem Dorsalerne 4 Par; fra Nakken til 1ste Dorsal 5 Par, indtil 2den Dorsal 17 Par; mellem Ventralerne og Analen 12 Par. Foran Ventralerne findes 23—25 Skjolde. Pectoralens Længde ubetydeligt større, end Hovedets. Skjægtraadene 5 paa hver Side, (4 enkelte i Mundvigen, 1 kløvet fortil i Underkjæven). Sidelinien har 23—25 Porer. Et Par korte Torne paa Snuden, et Par Knuder over Øjnene, og et Par større Knuder paa Panden. Farven graagul, med 2—3 større graabrune Tverpletter; Pectoralen og Caudalen henimod Spidsen brunsorte. Hannen har længere Ventraler, end Hunnen. Størrelsen indtil 210mm.*

M. B. 6; 1 D. 6 (5 ell. 7); 2 D. 6—7 (8); A. 7 (6 ell. 8); P. 14—16; V. 3; C. 2/11/2. Lin. lat. 23—25.

Localit. fra Nordh. Exped.: Havet mellem Nordcap og Spitsbergen.

	Stat. 323.	*Stat.* 326.	*Stat.* 338.	*Stat.* 363.
Beliggenhed.	180 Kil. S. O. Beeren Eiland.	105 Kil. N. Beeren Eiland.	Sydcap, Spitsbergen.	60 Kil. V. Norskøerne, Spitsb.
Dybde.	223 Favne (408m).	123 Favne (225m).	146 Favne (267m).	260 Favne (475m).
Temp. p. Bunden.	+ 1,5° C.	+ 1,6° C.	— 1,1° C.	+ 1,1° C.
Bunden.	Brungraat Ler.	Mørkt Ler.	Stenbund.	Blaaler.
Datum.	30te Juli 1878.	3die Aug. 1878	6te Aug. 1878.	14de Aug. 1878
Antal Indiv.	1 Indiv.	6 Indiv.	1 Indiv.	1 Indiv.

Bemærkninger til Synonymien. En udførlig Beskrivelse er givet, foruden af Cuvier og Valene. (Hist. Nat. Poiss. tom. 4), af Krøyer i Naturh. Tidsskr. 2 Række 1 B., som i 1844 beskriver saavel det udvoxede Individ *(Aspidophorus decagonus)*, som Ungen *(Aspidophorus spinosissimus)* som separate Arter, og afbilder begge i Gaimards Reise-Værk (Voyage Scand. Lap. etc. 1838—40,

Fam. Agonidæ.

Gen. Agonus, Schneid.

Bloch, Syst. Ichth., (ed. Schneid.), p. 104 (1801).

10. Agonus decagonus, Schneid. 1801.

Pl. II. fig. 11—12.

† *Cottus cataphractus*, Fabr. Fauna Grœnl. No. 112, p. 155 (1780).
Agonus decagonus, Schneid. Bloch, Syst. Ichth. p. 105 (1801).
Aspidophorus decagonus, Cuv. & Val. Hist. Nat. Poiss. tom. 4, p. 223 (1829).
Aspidophorus spinosissimus, Kr. Naturh. Tidsskr. 2 Række, 1 B. p. 250 (1844).
Aspidophorus malarmoides, Deslongch. Mém. Soc. Lin. Norm. tom. 9, p. 167 (1853).
Leptagonus spinosissimus, Gill, Proc. Acad. Nat. Sci. Philad. 1861, p. 167 (1861).
Archagonus decagonus, Gill, Proc. Acad. Nat. Sci. Philad. (*teste* Lütk.)

Diagnosis. — *Body slender, greatest breadth to total length as 1 to 8, length of head as 1 to 5. Normal number of shields: between the dorsals 4 pairs, from nuchal region to 1st dorsal 5 pairs; to commencement of 2nd dorsal 17 pairs; between the ventrals and the anal 12 pairs. Anterior to ventrals 23—25 shields. Length of pectorals slightly exceeding that of head. Five cirri on either side (4 at the angle of the mouth, 1 cleft, out on the lower jaw). Lateral line with 23—25 mucous pores. One pair of short spines on snout; above the eyes one pair of knotty protuberances, and a pair, of larger size, on the front. Colour greyish-yellow, relieved with 2—3 large transverse spots of greyish-brown; points of pectorals and caudal brownish-black; ventrals longest in male. Length reaching 210mm.*

M. B. 6. 1 D. 6 (5 or 7); 2 D. 6—7 (8); A. 7 (6 or 8); P. 14—16; V. 3; C. 2/11/2. Lin. lat. 23—25.

Locality (North Atl. Exped.): — The open sea, between the North Cape and Spitzbergen.

	Stat. 323.	*Stat.* 326.	*Stat.* 338.	*Stat.* 363.
Exact Locality.	180 Kil. S. E. Beeren Eiland.	105 Kil. N. Beeren Eiland.	South Cape, Spitzbergen.	60 Kil. N. Norsk Isl. Spitzb.
Depth.	223 Fathoms (408m).	123 Fathoms (225m).	146 Fathoms (267m).	260 Fathoms (475m).
Temp. at Bottom.	+ 1.5° C.	+ 1.6° C.	— 1.1° C.	+ 1.1° C.
Bottom.	Brownish-grey Loam.	Dark Clay.	Rocky Bottom.	Bluish Clay.
Date.	30th July 1878.	3rd Aug. 1878.	6th Aug. 1878.	14th Aug. 1878
Numb. of Specim.	1 Indiv.	6 Indiv.	1 Indiv.	1 Indiv.

Remarks on the Synonymy. — A full description of this species has been given by Cuvier and Valenc. (Hist. Nat. Poiss. tom. 4); also by Kröyer (Naturh. Tidsskr. 2 Række, 1 B.), who, in 1844, described the full-grown fish *(Aspidophorus decagonus)* and the immature form *(Aspidophorus spinosissimus)* as two species, both of which he subsequently figured for Gaimard's work (Voyage Scand.

pl. 5). Yngelen er yderligere beskreven (efter norske Individer) af Forf. i 1874 i „Norges Fiske“ p. 40, ligesom Dr. Lütken efter Materiale i Kjøbenhavns Musæum har givet værdifulde Bidrag til Kundskaben om denne og de nærstaaende Arters Synonymi og Variabilitet i Vid. Medd. fra Naturh. Foren. Kbhvn 1876, p. 382.

Bemærkninger til Beskrivelsen. Straaleantallet i de verticale Finner var hos Nordhavs-Expeditionens Individer en ikke ubetydelig Variation underkastet, idet dette vexlede i 1ste Dorsal mellem 5 og 7, i 2den Dorsal og i Analen mellem 6 og 8.

	Total-længde.	Hovedets Længde.	*1 D.*	*2 D.*	*A.*	*P.*
a.	140mm	27,5mm	5;	7;	7;	15—15.
b.	141 -	27 -	6;	7;	7;	14—14.
c.	147 -	30 -	5;	6;	7;	15—15.
d.	152 -	29,5 -	6;	5;	7;	14—14.
e.	152 -	29 -	6;	8;	8;	14—15.
f.	156 -	29 -	6;	7;	7;	15—15.
g.	168 -	31 -	6;	7;	7;	14—14.
h.	174 -	33 -	5;	6;	7;	14—14.
i.	178 -	33 -	7;	7;	6;	15—15.

Hos grønlandske Individer har Dr. Lütken, ifølge den ovenfor citerede Afhandling, fundet Straaleantallet at være: 1 D. 6 (5); 2 D. 6—7; A. 7 (5—8); P. 16 (15). Hos 3 Yngel-Individer fra Varangerfjorden fandt jeg: 1 D. 5—6; 2 D. 7; A. 7—8. Maaske have de grønlandske Individer regulært 1 Straale flere i Pectoralerne, end de, der bebo de spitsbergenske Farvande.

Antallet af Legemets Benskjolde varierede hos de 9 Individer inden følgende Grændser: Langs Ryglinien fra Nakken til Halen var oftest 44, undertiden 41—43 Skjolde; langs Buglinien oftest 39—40, undertiden 38 eller 41 Skjolde.

Fra Nakken til 1ste Dorsal fandtes i Regelen 5 Par Skjolde, fra Nakken til 2den Dorsal 17 Par. (2 Expl. havde 6 Par indtil 1ste Dorsal, saaledes ialt 18 Par, og et Individ havde paa den ene Side 5, paa den anden Side 6 Skjolde, saaledes indtil 2den Dorsal 17—18).

Gruppen foran Ventralerne talte 22—25 Skjolde, hvoraf enkelte vare ganske smaa.

Mellem begge Dorsaler vare 4 Par Skjolde. (Hos 1 Individ var der blot 3 Par, hos et andet $3^1/_2$ Par, hos et tredie 5 Par).

Mellem Ventralerne og Analen var somoftest Antallet 12 Par. (Hos 1 findes 13 Par, hos et andet blot 10 Par).

Sidelinien er ganske tydelig efter hele sin Længde. Porernes Antal varierede hos de 9 Individer mellem 23 og 25; i Begyndelsen staa de forholsvis tæt, omtrent ved hvert Skjold, men bagenfor Spidsen af Pectoralerne ere Afstandene længere.

Lap. etc. 1838—40, pl. 5). The fry of this fish (from the Norwegian coast) have been further treated of by the present author in 1874 (*vide* "Norges Fiske," p. 40); and Dr. Lütken has furnished valuable contributions to our knowledge of the synonomy and relative variability of this and other nearly related species in Vid. Medd. fra Naturh. Foren. Kbhvn. 1876, p. 382.

Descriptive Observations. — The number of rays in the vertical fins varied considerably in the specimens obtained on the North Atlantic Expedition, ranging in 1st dorsal from 5 to 7, in 2nd dorsal from 5 to 8, and in the anal from 6 to 8.

	Total Length.	Length of Head.	*1 D.*	*2 D.*	*A.*	*P.*
a.	140mm	27.5mm	5;	7;	7;	15—15.
b.	141 -	27 -	6;	7;	7;	14—14.
c.	147 -	30 -	5;	6;	7;	15—15.
d.	152 -	29.5 -	6;	5;	7;	14—14.
e.	152 -	29 -	6;	8;	8;	14—15.
f.	156 -	29 -	6;	7;	7;	15—15.
g.	168 -	31 -	6;	7;	7;	14—14.
h.	174 -	33 -	5;	6;	7;	14—14.
i.	178 -	33 -	7;	7;	6;	15—15.

In examples from the coast of Greenland the number of fin-rays, according to Dr. Lütken, was as follows: — 1 D. 6 (5); 2 D. 6—7; A. 7 (5—8); P. 16 (15). In three fry-specimens, from the Varanger Fjord, I found the fin-ray formula to be: 1 D. 5—6; 2 D. 7; A. 7—8; perhaps the additional ray in the pectorals is a peculiarity of structure in which the examples from Greenland differ from individuals inhabiting the shores of Spitzbergen.

The number of osseous shields on the body was found to vary, in the 9 individuals examined, within the following limits: along the dorsal line, from nape to origin of tail, most frequently 44, sometimes 41—43; along the line of the abdomen most frequently 39—40, sometimes 38—41.

From nape to 1st dorsal, in most of the specimens, 5 pairs of shields; from nape to 2nd dorsal 17 pairs (2 examples were furnished with 6 pairs from nape to 1st dorsal, or, in all, with 18 pairs, and one individual had 5 shields on one side and 6 on the other, or, in all, 17—18).

The group situated in front of the ventrals comprised 22—25 shields, some of which were very small.

Between the two dorsals occur 4 pairs of shields (in one individual only 3 pairs, in another 3 pairs and a half, in a third 5 pairs).

Between the ventrals and the anal the number of pairs is commonly 12 (one individual had 13, another only 10 pairs).

Lateral line distinctly obvious in its entire length. The number of pores varied in the 9 individuals from 23 to 25; the first in the series were arranged comparatively close, one at every shield almost, but, posterior to the extremities of the pectorals the interspace is greater.

Legemet er betydeligt slankere og mere langstrakt, end hos *A. cataphractus;* den største Bredde, der falder over Nakken, indeholdes omtr. 8 Gange i Totallængden.

Af Skjægtraade har denne Art paa hver Side 5; i Mundvigerne sidde 2 i Over-, og 2 i Underkjæven; den 5te sidder langt fortil i Underkjæven. Den sidste er altid kløvet, de øvrige ere enkelte. (1 Individ havde ogsaa den indre Traad i Overkjæven kløvet, et andet Individ havde Underkjævens forreste Traad ikke dobbelt, men endog 5-kløvet).

Ligesom det er Tilfældet med flere Cottoider, synes ogsaa hos denne Art Kjønnene at være ganske ulige repræsenterede i Antal. Af de 9 erholdte Individer var nemlig blot det ene (*c*) en Han, hvad der strax fremgik af de forlængede Ventraler. Medens de 2 Straaler, der danne denne Finne, hos alle de øvrige vare af lige Længde, og saa korte, at Finnens Længde ikke synderlig oversteg en Øjendiameter, havde hos dette ene Individ den ydre Straale, der var betydeligt længere, end de indre, en Længde af 17 mm, eller omtrent 2 Øjendiametre.

Farven var i det væsentlige ens hos alle. Bundfarven er gulgraa, og forsynet med 2—3 større Tverpletter, der danne Antydning til Baand, men idethele ikke ere særdeles skarpt markerede. Det forreste af disse ligger over Roden af Pectoralen, det andet (ofte utydeligt) over Slutningen af 1ste Dorsal, det 3die over Midten af 2den Dorsal. Mellem disse findes mindre, utydeligt begrændsede Petter og Skygninger. Finnerne ere ud mod Spidsen brunsorte; især er dette Tilfældet med Pectoralen og Caudalen. Undersiden af Legemet er uplettet graagul. Paa Hovedet gaar en temmelig bred, sort Streg fra Spidsen af Snuden gjennem Øjet, og fortsætter sig bagover paa Praeoperculum.

Levemaade og Føde. Den synes at være en afgjort Dybvandsart; de under Expeditionen erholdte Individer optoges fra en Dybde, der laa mellem 123 og 260 Favne, medens et Par Yngel-Individer fra Varangerfjorden (1874) erholdtes fra det noget grundere Vand (50—120 Favne). Som ovenfor nævnt, erholdtes et af Nordhavs-Expeditionens Indivi- fra den iskolde Area, hvor Vandets Temperatur var under 0° C.

I Ventrikelen af et af Individerne fandtes Amphipoder, væsentlig *Themisto libellula*, Mandt, og enkelte Individer af *Erythrops goësii*, G. O. Sars.

Udbredelse. *A. decagonus* er allerede af Fabricius omtalt fra Grønland i 1780 i hans Fauna Groenl. (under Navn af *A. cataphractus*), og den er senere gjentagne Gange nedsendt fra disse Landsdele til Musæet i Kjøbenhavn. Paa samme Side af Atlanterhavet gaar den idetmindste ned til Newfoundland. Fremdeles er den, ifølge Dr. Lütken, erholdt ved Island. Ved Spitsbergen er den maaske ikke

The body is much more slender and elongate in form than is the case with *A. cataphractus;* extreme breadth, across the nape, about one-eighth only of total length.

The cirri in this species number 5 on each side, disposed as follows: 2 on the upper and 2 on the lower jaw, at the angle of the mouth, and the fifth far out on the lower jaw. This barbel is always cleft, the rest consist each of a single filament; in one specimen the posterior barbel on the upper jaw was likewise cleft; another had the anterior cirrus on the lower jaw not doubly, but quintuply cleft.

As is the case with several species of Cottoids, the sexes appear to be very unequally represented in *A. decagonus* with regard to number. Of the 9 individuals obtained, one only (*c*) was a male, a fact immediately apparent from the elongated ventrals. In all the other examples, the 2 rays composing this fin were of equal length, and so short, that the length of the fin hardly exceeded the longitudinal diameter of the eye, whereas in this individual the exterior ray, which was considerably longer than the inner, had a length of 17 mm, about equal to twice the diameter of the eye.

The colour was in all these specimens essentially the same. Ground-colour yellowish-grey, relieved with two or three comparatively large transverse spots or bands, not very clearly defined however. The first of these spots occurs immediately above the origin of the pectorals, the second (in many individuals indistinct) above the termination of the 1st dorsal, the third above the central portion of the 2nd dorsal. In between these patches are a number of small indistinct spots and cloudings. The fins brownish-black towards the points; this is the case more especially with the pectorals and the caudal. The under surface of a uniform greyish-yellow. A black streak extends from the point of the snout through the eye, passing from thence backwards over the preoperculum.

Habits and Food. — This species decidedly appears to be a deep-sea fish; the specimens obtained on the Expedition were brought up from a depth of 123—260 fathoms; three individuals in the fry stage of growth, from the Varanger Fjord (1874), were taken in shallower water (50—120 fathoms). As before stated, one of the examples taken on the Expedition was brought up from the cold area, where the temperature was below that of ice.

In the stomach of one of the individuals examined were divers Amphipods, chiefly *Themisto libellula*, Mandt, and examples of *Erythrops goësii*, G. O. Sars.

Distribution. — *A. decagonus* was mentioned, as occurring on the coast of Greenland, as far back as 1780, by Fabricius, in his Fauna Grœnl. (the name given it being *A. cataphractus*), and since then specimens have been repeatedly sent from those regions to the Zoological Museum in Copenhagen. On the shores of North America its range extends at least as far south as Newfoundland. According

særdeles sjelden, idetmindste paa Dybderne udenfor denne Øgruppe. Endelig er den fundet ved Finmarkens Kyster saavel østenfor Nordcap (i Varangerfjorden), som i Vest-Finmarken (Lyngen); den er i Norge hidtil ikke fundet søndenfor 70° N. B.

Fam. Cyclopteridae.

Gen. Eumicrotremus, Gill.

Proc. Ac. Nat. Sci. Philad. 1864. p. 190 (1864).

Legemet næsten kugleformigt, med kort Hale, og beklædt med store, conisk tilspidsede Bentuberkler. 1ste Dorsal distinct, af Bygning som 2den Dorsal; de øvrige Finner, samt Sugeskiven, som hos Cyclopterus. Gjællespalten særdeles liden, dens Højde mindre, end Øjets Diameter, beliggende højt ovenfor Pectoralernes Fæste. Sidelinie tilstede. Flere Rækker fine Tænder i Kjæverne.

11. Eumicrotremus spinosus, (Müll.) 1776.

Pl. II, Fig. 13.

Cyclopterus spinosus, Müll. Prodr. Zool. Dan. p. IX (1776).
Eumicrotremus spinosus, Gill, Proc. Acad. Nat. Sci. Philad. Sept. 1864, p. 190 (1864).
Cyclopterus orbis, Günth. Cat. Fish. Brit. Mus. vol. 3, p. 158 (1861).

Diagn. *Hovedet stort, indeholdes $2^1/_2$—3 Gange i Totallængden. 2 Par tubeformige Næsebor. Sugeskiven stor, indeholdes lidt over 4 Gange i Totallængden. Anus ligger nærmere Sugeskiven, end Analen. Bentuberklerne have bredt rundagtig Basis, ere tæt chagrinerede, og danne 5—6 uregelmæssige Længderækker; Trakten om Anus, samt Finnerne ere nøgne. Sidelinien højtliggende, har omtrent 13 Porer. Haleroden lav, indeholdes blot $^2/_3$ Gange i Øjets Diameter. Størrelsen indtil 160^{mm}.*

1 D. 6—7; 2 D. 10—12 (13); A. 10—12; P. 23—25; C. 10—11. Lin. lat. 13.

Localit. fra Nordh.-Exped. Spitsbergen.

Beliggenhed.	Isfjorden, Spitsbergen.
Dybde.	120 Favne (236^m).
Temp. paa Bunden.	— 1,2° C.
Bunden.	Stenbund og Mudder.
Datum.	19de August 1878.
Antal Individer.	1 Indiv.

to Dr. Lütken it has also been met with off the coast off Iceland. On the coast of Spitzbergen it is not, perhaps, very rare, at least in deep water off that group of islands. It occurs, too, on the coast of Finmark, both east of the North Cape (in the Varanger Fjord) and in West Finmark (Lyngen), but has not hitherto been met with further south than 70° N.

Fam. Cyclopteridæ.

Gen. Eumicrotremus, Gill.

Proc. Ac. Nat. Sci. Philad. 1864; p. 190 (1864).

Body almost globular, studded with large osseous tubercles, cuneiform in shape and pointed. First dorsal distinct, similar in structure to second dorsal; the other fins and the ventral disk as in Cyclopterus. Branchial opening placed high above the base of the pectorals, exceedingly narrow, its depth being less than the diameter of the eye. Lateral line obvious. Several series of minute teeth in the jaws.

11. Eumicrotremus spinosus, (Müll.) 1776.

Pl. II, fig. 13.

Cyclopterus spinosus, Müll. Prodr. Zool. Dan. p. IX (1776).
Eumicrotremus spinosus, Gill. Proc. Acad. Nat. Sci. Philad. Sept. 1864, p. 190 (1864).
Cyclopterus orbis, Günth. Cat. Fish. Brit. Mus. vol. 3, p. 158 (1861).

Diagnosis. — *Head large, length to total length as 1 to $2^1/_2$—3; 2 pairs of tubular nostrils; ventral disk large, its diameter slightly exceeding one-fourth of the extreme length of the body; vent nearer the disk than the anal; the osseous tubercles, disposed in 5—6 irregular longitudinal rows, are closely granulated, and broad at the base; the region environing the vent and the fins is smooth; lateral line, consisting of about 13 pores, high up the side; root of tail slender, its height being two-thirds only of the diameter of the eye. Length reaching 160^{mm}.*

1 D. 6—7; 2 D. 10—12 (13); A. 10—12; P. 23—25; C. 10—11. Lin. lat. 13.

Locality (North Atl. Exped.): — Spitzbergen.

Exact Locality.	The Isfjord, Spitzbergen.
Depth.	129 Fathoms (237^m).
Temp. at Bottom.	— 1.2° C.
Bottom.	Rock and Mud.
Date.	19th August 1878.
Numb. of Specim.	1 Indiv.

Bemærkninger til Synonymien. Opførelsen af denne Art under en særegen Slægt synes tilstrækkeligt at kunne begrundes ved Bygningen af Gjællespalten, der er reduceret til en trang Aabning højt over Pectoralernes Rod, samt ved den normalt byggede 1ste Dorsal, der ikke er omhyllet af den tykke Beklædning, der, som hos Slægten *Cyclopterus*, bringer denne Finne til næsten at forsvinde under Legemets almindelige Omrids. *Eumicrotremus* danner en bestemt Overgang til Lipariderne, baade paa Grund af Gjællespaltens Form og Stilling, og fordi Tænderne danne tydelige Rækker i Kjæverne.

Som en anden Art af samme Slægt har Dr. Günther i 1861 opstillet *Cyclopterus orbis*, beskreven efter et enkelt Individ med en Totallængde af 22 eng. Linier (omtr. 57^{mm}) fra Beringshavet. Denne adskiller sig fra *E. spinosus* hovedsagelig blot ved et ringere Antal Straaler i 2den Dorsal og i Analen, idet dette hos Dr. Günthers Individ (Cat. Fish. Brit. Mus. vol. 2 p. 158) var blot 9 i begge de nævnte Finner.

Da Universitets-Musæet i Christiania nylig har modtaget et velconserveret Exemplar af denne Form fra samme Trakt (Kamtschatka), har jeg kunnet anstille en nøje Sammenligning mellem begge Former, og tror efter denne ikke at kunne opføre *C. orbis* som en fra *E. spinosus* distinct Art. Totallængden af dette sidste Exemplar var 70^{mm}, hvoraf Hovedets Længde var 22^{mm}; Øjets Diameter 7^{mm}, og udgjorde saaledes 1/3 af Hovedlængden[1]. Interorbitalrummet var 13^{mm}, Sugeskivens Længdediameter 15^{mm}. Straaleantallet var følgende: 1 D. 7; 2 D. 10; A. 10; C. 11; P. 24.

Da *E. spinosus* (ifølge Günther) kan have 10 Straaler i Analen, og 11 i 2den Dorsal, synes sikre Distinctions-Characterer ikke at kunne hentes af dette Forhold, og da heller ikke de øvrige Characterer kunne sees i nogen væsentlig Grad at være forskjellige fra *E. spinosus*, synes det rettest at henføre *C. orbis* som synonym under denne Art, der saaledes er den eneste hidtil kjendte i sin Slægt.

Allerede i 1776 blev Arten af O. F. Müller tildelt sin første foreløbige Diagnose efter et Individ, nedsendt fra Grønland gjennem Fabricius. I 1780 blev den udførligere beskreven af Fabricius selv i Fauna Groenland. (No. 93, p. 134), og senere i 1798 af samme Forf. i Naturhistorie-Selskabets Skrifter (4de B. 2 Afd. p. 77). Fuldstændig Beskrivelse er endvidere givet i 1847 i Naturh. Tidsskrift (2 Række, 2 B. p. 262) af Krøyer, som ligeledes i 1851 har afbildet Arten i Gaimards Planchesværk (Voyage etc. 1838—40. Poiss. pl. 4). Senest er den i 1861 af Dr. Günther beskrevet i Catal. Fish. Brit. Mus. (vol. 3, p. 157); samme Forf. har i 1877 i Proc. Zool.

[1] Naar Dr. Günther i sin Diagnose af *E. spinosus* anfører Øjet som udgjørende 1/4 af Hovedets Længde, er dette ikke Tilfældet hos Nordhavs-Expeditionens Individ, hvis Hovedlængde er 25^{mm}, og Øjets Diameter 9^{mm}, saaledes, at den sidste udgjør lidt over 1/3 af Hovedlængden.

Remarks on the Synonymy. — For the establishing of this species under a separate genus there would appear to be sufficient reason in the characteristic form of the branchial opening, reduced as it is to a narrow slit, placed high above the pectoral fin; also in the fact of the 1st dorsal being normal in structure, and not enveloped in the thick membranous integument which, in the genus *Cyclopterus*, well nigh conceals this fin beneath the contour of the body. *Eumicrotremus*, both from the form and position of the branchial orifices, and from the teeth being arranged in distinct series in the jaws, may be regarded as a well-defined transition-genus, approximating the *Liparididæ*.

As a second species of the same genus, Dr. Günther, in 1861, etablished *Cyclopterus orbis*, describing it from a single specimen, having a total length of 22 English lines (about 57^{mm}), taken in Bering's Straits. *C. orbis* is distinguished from *E. spinosus* chiefly by the smaller number of rays in the second dorsal and in the anal; the individual examined by Günther had, for instance, only 9 rays in each of those fins.

The University Museum in Christiania having lately come into possession of a well-preserved example of this form, taken in the same region (Kamtschatka), I have had an opportunity of closely comparing the two forms, and am of opinion that *C. orbis* can not be classed as a separate species, distinct from *E. spinosus*. The total length of this individual was 70^{mm}; length of head 22^{mm}; diameter of eye 7^{mm}, or about one-third of the length of the head;[1] interorbital space 13^{mm}; longitudinal diameter of ventral disk 15^{mm}. The fin-ray formula was as follows: — 1 D. 7; 2 D. 10; A. 10; C. 11; P. 24.

E. spinosus, can, according to Dr. Günther, have 10 rays in the anal and 11 in the 2nd dorsal fin, and hence the fin-ray formula is of itself hardly sufficient to furnish a distinctive character; and not differing materially in other respects from *E. spinosus*, *C. orbis* may, it would seem, be safely regarded as identical with the former, which, in that case, is the only species hitherto observed of its genus.

As for back as 1776, O. F. Müller gave the first preliminary diagnosis of the species, from a specimen sent from Greenland by Fabricius. In 1780 it was more fully described by Fabricius himself, in his Fauna Grœnland. (No. 93, p. 134), and subsequently, in 1798, by the same author (Naturhistorie-Selskabets Skrifter, 4 B. 2 Afd. p. 77). A full description also appeared in 1847, by Kröyer (Naturh. Tidsskr., 2 Række, 2 B. p. 262), who, in 1851, likewise figured the species for the plates to Gaimard's work (Voyage etc. 1838—40, Poiss. pl. 4). The latest diagnosis is that by Dr. Günther, in 1861 (Catal. Fish. Brit. Mus. vol. 3, p. 157); and in 1877 the same

[1] In Dr. Günther's diagnosis of *E. spinosus*, the diameter of the eye is stated to measure one-fourth of the length of the head; this was not the case, however, in the individual obtained on the North Atlantic Expedition, the length of the head having been 25^{mm}, and the diameter of the eye 9^{mm}, or a fraction more than a third.

Soc. of London (p. 294) givet i Træsnit Afbildninger af Yngelen.

Bemærkninger til Beskrivelsen. Totallængden af det under Expeditionen erholdte Individ var 79^{mm}, hvoraf Hovedets Længde var 25^{mm}. De conisk tilspidsede Bentuberkler beklæde Legemet saa tæt, at deres Grundlinier paa Siderne af det egentlige Legeme i Regelen berøre hinanden; paa Halen ere de alle mindre. Paa de 5 første Straaler af 1ste Dorsal sidder paa hver Side ifen mod Spidserne en liden, chagrineret Bentorn. Endvidere er Grunden af Pectoralerne paa Ydersiden beklædt paa samme Maade, som Legemet og Hovedet.

Straaleantallet var: 1 D. 7; 2 D. 12; A. 12; P. 23; C. 10.

Tilstedeværelsen af en Sidelinie synes ikke at være omtalt i noget af de ovenfor anførte Skrifter, og Krøyer nævner udtrykkelig, at den mangler. En Sidelinie er ikkedestomindre tilstede, og Porerne ere overalt tydelige, om end ikke særdeles store[1]. Den udspringer ved Gjællespaltens øvre Ende, er i Begyndelsen temmelig højtliggende, men bøjer under 2den Dorsal skraat nedad mod Legemets Midtlinie, som den naar i omtrent 1/3 Hovedlængdes Afstand fra Haleroden, og løber herfra ret ud mod Caudalen. Antallet af Porer er paa den ene Side 13, paa den anden 14.

Udbredelse. I Modsætning til *Cyclopterus lumpus* synes denne at være en Dybvandsart, der blot forekommer paa 60—200 Favnes Dyb (eller derover). Den hører til de Arter Fiske, som ere fundne længst mod Nord. Fra Grønland, hvor den er talrig, er den, som ovenfor nævnt, allerede kjendt fra forrige Aarhundrede gjennem Müller og Fabricius, og fandtes sidst i 1875 af den engelske Nordpol-Expedition paa flere Punkter af Vest-Grønland op til mellem 79 og 80° N. B. Fremdeles er den, ifølge Faber, funden ved Island (Fische Isl. p. 54, 1829); ved Spitsbergen er den ligeledes, som det synes, hyppig, og er her funden af Krøyer allerede i 1838, og senere af alle de efterfølgende Expeditioner i disse Farvande. Den er hidtil ikke fundet ved det europæiske Continent, men forekommer sandsynligvis ogsaa her paa passende Dybder af Ishavet. Da, som ovenfor nævnt, *Cyclopterus orbis* fra Beringshavet neppe kan opfattes som en fra *Eumicrotremus spinosus* skilt Art, er den saaledes i sin Udbredelse maaske circumpolær.

[1] Sandsynligvis er den oftest utydelig hos Individer, der have ligget længe i Spiritus, men vil i Regelen atter vise sig, om Individet opblødes en Tid i Vand.

author figured the fry of the species on wood. (Proc. Zool. Soc. of London, p. 294).

Descriptive Observations. — The total length of the individual taken on the Expedition was 79^{mm}; length of head 25^{mm}. The cuneiform osseous tubercles are so closely disposed over the body that their basal lines, in the lateral region, are as a rule contiguous; on the tail, these tubercles are all considerably smaller. The 5 first rays in the first dorsal are furnished on either side towards the point with a small granulated spine. Moreover, the base of the pectorals, exteriorly, is invested with a tegument similar to that covering the head and the body.

Number of fin-rays: — 1 D. 7; 2 D. 12; A. 12; P. 23; C. 10.

The occurrence of a lateral line does not appear to have been observed by any of the naturalists whose works are cited above; nay, Kröyer emphatically declares it to be wanting. A lateral line nevertheless there is, and the pores, though not particularly large, are distinctly perceptible.[1] It commences at the upper extremity of the branchial opening, extending from thence nearly straight till a little below the 2nd dorsal, where it suddenly bends downwards, striking off obliquely to the mesial line, which it meets at a point distant about half the length of the head from the origin of the tail, and then passing straight to the caudal. Number of pores 13—14.

Distribution. — Unlike *Cyclopterus lumpus*, this would appear to be a deep-sea species, occurring at a depth of from 60 to 200 fathoms (or still deeper), and is one of the fishes whose range extends furthest north. On the coast of Greenland, where it is common, it was observed as far back as the last century, by Müller and Fabricius, having been latest met with on the English North Pole Expedition, 1875, in divers localities on the western shores of Greenland, as far north as 79° and 80°. According to Faber, (Fische Isl. p. 54, 1829) it inhabits the coast of Iceland; off Spitzbergen it is likewise said to be numerous, having been observed in those regions by Kröyer, in 1838, and since then on all subsequent Arctic Expeditions. Up to the present time it has not been met with off the continent of Europe, but occurs probably here too at the right depth. *Cyclopterus orbis*, from Bering's Straits, being, as before observed, hardly entitled to rank as a species distinct from *E. spinosus*, it is perhaps circumpolar in its range.

[1] Probably it is more or less obliterated in specimens preserved for any length of time in spirits, but will again become obvious if the skin be sufficiently moistened with water.

Fam. Liparididae.

Gen. Liparis, Cuv.

Règne Anim. éd. I, tom. 2, p. 227 (1817).

12. Liparis lineatus, (Lepech.) 1774.

Cyclopterus liparis, Lin. Syst. Nat. ed. 12, tom. 1, p. 414 (1766).
Cyclopterus lineatus, Lepech. Nov. Comm. Acad. Petr. tom. 18, p. 522 (1774).
? *Cyclopterus musculus*, Lacép. Hist. Poiss. tom. 4, p. 685 (1798).
Liparis vulgaris, Flem. Hist. Brit. Anim., p. 190 (1828).
Liparis barbatus, Ekstr. Kgl. Vet. Akad. Handl. 1832, p. 168 (1832).
Liparis lineata, Kr. Naturh. Tidsskr. 2. Række, 2. B., p. 284, 1846—49 (1847).
Liparis stellatus, Malm. Förh. Skand. Naturf. 9de Möte 1863, p. 412 (1863).
? *Liparis arctica*, Gill, Proc. Ac. Nat. Sci. Philad. 1864, p. 191 (1864).

Diagn. *Hovedet mindre, end Legemets største Højde, og indeholdes 4 Gange i Totall. Øjnene smaa, indeholdes 5 Gange i Hovedets Længde. Analen bedækker 1/4 (hos Ungerne 1/3) af Caudalens Rod; Dorsalen naar til (hos Ungerne lidt udover) samme. Snuden længere, end Øjets Diameter. Underkjæven kortere, end Overkjæven. Sugeskiven stor, udgjør 1/8 (hos Ungerne 1/7) af Totall., eller Halvdelen af Hovedets Længde. Pectoralen med en dyb Indskjæring, og de nedre Straaler atter forlængede. Caudalen tvert afrundet, indeholdes 8 (hos Ungerne 7) Gange i Totall. Anus beliggende midt mellem Sugeskiven og Analen. Farven varierende; ensfarvet, plettet eller stribet. Længden indtil 130mm (og derover).*

M. B. 7. D. 32—42; A. 26—38; P. 32—42; C. 10—11[1].

Localit. fra Nordh. Exped. Spitsbergen.

	—	Stat. 366.
Beliggenhed.	Norskøerne, Nord-Spitsbergen.	Magdalenebay, Nord-Spitsbergen.
Dybde.	Ubetydelig.	50 Favne (91m).
Temp. paa Bunden.	—	— 1,0° C.
Bunden.	—	Mørkegraat Ler.
Datum.	15de Aug. 1878.	17de Aug. 1878.
Antal Indiv.	3 Indiv.	1 Indiv.

Bemærkninger til Beskrivelsen. De 3 først erholdte Individer tilhøre den Farve-Varietet, som jeg i en tidligere Afhandling[2] har benævnt *var. i, arcticus*, og som sandsynligvis gaar ind under den af Gill i Proc. Acad. Nat. Sci. Philad. 1864 opstillede *L. arctica*. Denne Farve-

[1] Østersøen: D. 32—35; A. 28 (Malmgr.).
Norge: D. 34—38; A. 28—31 (C.).
Spitsbergen: D. 36—40; A. 29—34 (Malmgr.).
Spitsbergen: D. 38—42; A. 31—38 (Nordh.-Exped.).
Grønland: D. 41—43; A. 33—37 (Malmgr., Gill).
[2] Forh. Vid. Selsk. Chra. 1879, No. 1, p. 44.

Fam. Liparididæ.

Gen. Liparis, Cuv.

Règne Anim. éd. I. tom. 2, p. 227 (1817).

12. Liparis lineatus, (Lepech.), 1774.

Cyclopterus liparis, Lin. Syst. Nat., ed. 12, tom. 1, p. 414 (1766).
Cyclopterus lineatus, Lepech. Nov. Comm. Acad. Petr., tom. 18, p. 522 (1774).
? *Cyclopterus musculus*, Lacép. Hist. Poiss. tom 4, p. 685 (1798).
Liparis vulgaris, Flem. Hist. Brit. Anim. p. 190 (1828).
Liparis barbatus, Ekstr. Kgl. Vet. Akad. Handl. 1832, p. 168 (1832).
Liparis lineata, Kr. Naturh. Tidsskr. 2. Række, 2. B. p. 284, 1846—49 (1847).
Liparis stellatus, Malm. Förh. Skand. Naturf. 9 Möte, 1863, p. 412 (1863).
? *Liparis arctica*, Gill, Proc. Ac. Nat. Sci. Philad. 1864, p. 191 (1864).

Diagnosis. — *Length of head less than depth of body, and equal to one-fourth of total length; eyes small, diameter one-fifth of the length of the head; anal covering one-fourth (in young examples one-third) of the base of the caudal; dorsal extending back to this point (in young examples a little beyond it); length of snout greater than diameter of eye; lower jaw shorter than upper; ventral-disk large, equalling one-eighth (in young examples one-seventh) of total length, or half the length of the head; pectorals with a deep incision, lower rays elongate; caudal slightly convex, length to total length as 1 to 8 (in young examples as 1 to 7); vent placed midway between ventral-disk and anal. Colour varying; uniform, spotted, or striped. Length reaching 130mm.*

M. B. 7; D. 32—42; A. 26—38; P. 32—42; C. 10—11[1].

Locality (North Atl. Exped.): — Spitzbergen.

	—	Stat. 366.
Exact Locality.	Norsk Øer, North Spitzbergen.	Magdalene Bay, North Spitzbergen.
Depth.	Trifling.	50 Fathoms (91m).
Temp. at Bottom.	—	— 1.0° C.
Bottom.	—	Dark-grey Clay.
Date.	15th Aug. 1878.	17th Aug. 1878.
Numb. of Specim.	3 Indiv.	1 Indiv.

Descriptive Observations. — The three first of these individuals belong to the variety which I designated in a former paper,[2] *var. i, arcticus*, and which probably is comprised in Gill's *L. arctica* (Proc. Acad. Nat. Sci. Philad. 1864). This variety, more numerous it would appear off

[1] The Baltic: D. 32—35; A. 28 (Malmgr.).
Norway: D. 34—38; A. 28—31 (C.).
Spitzbergen: D. 36—40; A. 29—34 (Malmgr.).
Spitzbergen: D. 38—42; A. 31—38 (North Atl. Exped.).
Greenland: D. 41—43; A. 33—37 (Malmgr., Gill).
[2] Forh. Vid. Selsk. Chra. 1879, No. 1, p. 44.

varietet, der synes at være den paa Spitsbergen, eller idethele i det rent arctiske Gebet hyppigst optrædende Form af Arten, er næsten ensfarvet uden større Pletter eller Striber. Bundfarven, som er graagul, er næsten skjult af yderst fine, tætstillede, brune Punkter; hos de yngre ere disse især udbredte over Finnerne og paa Legemets Sider, som derved erholde en brunlig Afskygning, ligesom hist og her, saaledes som paa Bugen, Bundfarven kan optræde uplettet.

Disse Individers Maal og Straaleantal var følgende:

	Totallængde.	Hovedets Længde.	D.	A.
a.	45 mm	12 mm	41;	34.
b.	49 -	13,5 -	38;	31.
c.	104 -	24 -	40;	32.

Det 4de Individ, der er det største, og noget defect, idet Huden tildels er afrevet, ligesom Caudalen mangler, har jeg i min foreløbige Oversigt[1] troet at burde henføre under *L. tunicatus*, Reinh., væsentlig paa Grund af et større Straaleantal i Analen og Pectoralen, samt den sidstnævnte Finnes betydelige Længde, idet Spidsen naar lidt forbi Begyndelsen af Analen. Sandsynligvis udgjør det dog blot et stort Individ af *L. lineatus*, og gaar blandt de i den ovenfor anførte Afhandling nævnte Varieteter nærmest ind under *var. c. subfuscus*. Af denne Varietet har Universitets-Museet allerede flere mindre Exemplarer fra Varangerfjorden i Norge.

Dette sidstnævnte Individ, der var en Hun med et overordentlig stort Antal fine Rogn i Ovarierne, havde følgende Maal: Totall. 122 mm (omtr.); Hovedets Længde 33 mm; Straaleantallet var: *D.* 42. *A.* 38. *P.* 39—42.

Bundfarven, der er lyst graagul, er omtrent ligesaa stærkt fremtrædende, som de smaa uregelmæssige Pletter (under en Orbitaldiameters Størrelse), der er jevnt fordelte over den. Hist og her ere Pletterne lidt sammenhængende, uden dog at danne Linier; de horizontale Finner ere derimod stribede paa tvers. Huden er overordentlig løst vedhængende, skjønt Individet var vel conserveret.

Paa Gjællerne af dette Individ snyltede et Exemplar af en stor Lernæide (sandsynligvis *Haemobaphes cyclopterina*, Fabr.).

Føde. Ventrikelen af det ene Individ fandtes fyldt med smaa Crustaceer, nemlig en *Caprella septemtrionalis*, Kr., samt flere Individer af *Protomedeia fasciata*, Kr.; den sidste Amphipode fandtes ligeledes hos et af de unge Individer. I Ventrikelen af det største Individ fandtes Dele af en større Annelide, *Pectinaria auricoma*, (Müll.).

[1] Forh. Vid. Selsk. Chra. 1878, No. 14, p. 30.

Spitzbergen and throughout the Arctic regions generally than any other form of the species, is of an almost uniform colour, exhibiting no vestige of large spots or stripes. The ground-colour, greyish-yellow, nearly concealed by a multitude of closely disposed minute brown specks; in comparatively young individuals these minute spots are dispersed in particular over the fins and along the lateral region of the body, which they blur with a brownish tinge; and here and there, too, as on the abdominal surface, the ground-colour occurs uniformly spotless.

Principal dimensions, and number of fin-rays: —

	Total Length.	Length of Head.	D.	A.
a.	45 mm	12 mm	41;	34.
b.	49 -	13.5 -	38;	31.
c.	104 -	24 -	40;	32.

The fourth specimen is much the largest, but somewhat mutilated; portions of the skin having been torn off; the caudal, too, is wanting; in my preliminary report[1] I have referred it to *L. tunicatus*, Reinh., chiefly by reason of the greater number of fin-rays in the anal and the pectorals, and from the very considerable length of the latter fin, the points of which extend a short distance past the origin of the anal. Probably, however, this specimen was merely a large-sized individual of *L. lineatus*, and should in that case rank under *var. c. subfuscus*, mentioned in the paper cited above. Of this variety the University Museum is already in possession of several smaller specimens from the Varanger Fjord.

This, the last of the individuals, a female, having in the ovaries large quantities of minute ova, measured as follows: — Total length 122 mm (about); length of head 33 mm; number of fin-rays: — *D.* 42; *A.* 38; *P.* 39—42.

The ground-colour, a uniform light greyish-yellow, and the small irregularly disposed spots (somewhat less in diameter than the length of the orbit) cover about an equal extent of surface. In places, the spots exhibit a tendency to approximate, without however forming lines; the horizontal fins, on the other hand, are distinctly marked with transverse stripes. The skin is remarkably lax, notwithstanding the individual was in all respects a well-preserved specimen.

On the gills of this individual occurred a large example of a Lernæan parasite (possibly *Hæmobaphes cyclopterina*, Fabr.).

Food. — The stomach of this one specimen was found distended with small crustaceans, viz. a *Caprella septemtrionalis*, Kr., and divers examples of *Protomedeia fasciata*, Kr.; the latter Amphipod was likewise detected in the ventricle of one of the young specimens. The stomach of the largest individual contained fragments of a large Annelid, *Pectinaria auricoma*, (Müll.).

[1] Forh. Vid. Selsk. Chra. 1878, No. 14, p. 30.

Udbredelse. Da Artsbegrændsningen hos denne Slægt endnu i flere Henseender er usikker, kan Udbredelsen af *L. lineatus* endnu ikke med Nøjagtighed opgives. Flere Omstændigheder tyde dog paa, at den har en forholdsvis vid Udbredelse; foruden at den under en Mangfoldighed af Farvevarieteter forekommer fra Østersøen og England af, og langs den svensk-danske og hele den norske Kyst op til Spitsbergen, hvor den endnu under 80° N. B. naar en frodig Udvikling, forekommer den desuden ved Island, Grønland, og Nordamericas Kyster ned til New England-Staterne, idet den er funden, ifølge Goode & Bean, i Massachusetts Bay. Mod Øst gaar den idetmindste ind i det hvide Hav (hvorfra den beskreves af Lepechin allerede i 1774).

13. **Liparis bathybii**, Coll. 1878, (n. sp.)

Pl. II, Fig. 14.

Liparis (Paraliparis) bathybii, Coll. Forh. Vid. Selsk. Chra. 1878, No. 14, p. 32 (1878).

Diagn. *Hovedet kort og rundt; dets Længde lig Legemets største Højde, og indeholdes* $5\frac{1}{2}$ *Gange i Total. Øjet (Orbita) stort; dets Længdediameter indeholdes* $3\frac{1}{2}$ *Gange i Hovedets Længde, og omtrent* $1\frac{2}{3}$ *Gange i Interorbitalrummets Bredde. Dorsalen og Analen bedække* $\frac{2}{3}$ *af Caudalen. Snuden kort, ubetydeligt længere end Orbita. Pectoralens øvre og nedre Parti adskilte ved et Mellemrum, der er opfyldt af 3—4 rudimentære Straaler. (Øjnene, Sugeskiven, og Beliggenheden af Anus ubekjendt). Farven sandsynligvis overalt brunsort. Størrelsen hos det undersøgte Individ (en Hun) 208*^{mm}.

M. B. 7. D. 59; A. 51; P. 13/3(4)/3; C. 8.

Localit. fra Nordh. Exped. Havet vestenfor Beeren Eiland.

	Stat. 312.
Beliggenhed.	108 Kilom. V. Beeren Eiland.
Dybde.	658 Favne (1203^m).
Temp. paa Bunden.	-1.2° C.
Bunden.	Brunt og grønt Ler.
Datum.	22de Juli, 1878.
Antal Individer.	1 Indiv.

Bemærkninger til Synonymien. Det erholdte Individ fandtes ved Trawlnettets Undersøgelse i en særdeles medtagen Tilstand indeklemt mellem Stene og Ler, saaledes, at det kun med den største Vanskelighed lod sig løsne. Huden, der sandsynligvis har siddet ganske løst, var næsten overalt fraréven, eller hengte i løse Fryndser; dette har i

Distribution. — The specific limits of this genus being as yet in many respects undetermined, the exact range of *Liparis lineatus* cannot be given. Divers circumstances lead us however to infer that the species is widely distributed; besides occurring — with regard to colour in numerous varieties — in the Baltic, on the shores of Great Britain, and on the Swedish, Danish, and Norwegian coasts, as far north as Spitzbergen, where, in lat. 80° N., it attains a high degree of development, the species, likewise inhabits the shores of Iceland and Greenland, its range extending from thence along the North American coast, as far south as New England, having been observed in Massachusetts Bay. *L. lineatus* has been met with as far east as the White Sea, the first to describe it as occurring there having been Lepechin, in 1774.

13. **Liparis bathybii**, Coll. 1878, (n. sp.)

Pl. II, fig. 14.

Liparis (Paraliparis) bathybii, Coll. Forh. Vid. Selsk. Chra. 1878, No. 14, p. 32 (1878).

Diagnosis. — *Head short and globular; equal in length to the depth of the body, and is to total length as 1 to* $5\frac{1}{2}$*; eyes (orbitæ) large, their longitudinal diameter being to the length of the head as 1 to* $3\frac{1}{2}$*, and to width of inter-orbital space about as 1 to* $1\frac{2}{3}$*; the dorsal and anal fins covering two-thirds of the caudal; snout short, but slightly exceeding the diameter of the orbit; the upper and lower divisions of the pectorals are separated by a space furnished with 3—4 rudimentary rays (concerning the eyes, the ventral disk, and the position of the vent nothing is known). Colour brownish-black. Length of body in the specimen examined (female) 208*^{mm}.

M. B. 7; D. 59; A. 51; P. 13/3(4)/3; C. 8.

Locality (North Atl. Exped.): — The open sea, west of Beeren Eiland.

	Stat. 312.
Exact Locality.	108 Kil. W. of Beeren Eiland.
Depth.	658 Fathoms (1203^m).
Temp. at Bottom.	-1.2° C.
Bottom.	Brown and Green Clay.
Date.	22th July 1878.
Numb. of Specim.	1 Indiv.

Observations on the Synonymy. — The specimen obtained was brought up with the trawl-net in a very mutilated condition, being jammed in between stones and clay, in such a manner that the greatest difficulty was experienced in extricating it. The skin, which in all probability was very lax, had been torn off over the whole

flere Henseender været uheldigt, fornemmelig fordi Pectoralerne ere af en særegen Bygning, som det havde været af særdeles Interesse at komme til fuld Klarhed om. Fremdeles manglede hele Sugeskiven, medens dog dens Plads sandsynligvis endnu kan sees; og da Bugen paa Siderne og nærmest Analen var opreven, kan heller ikke Beliggenheden af Anus med Sikkerhed angives. Endelig vare Øjnene udfaldne; derimod vare saagodtsom alle Finnestraaler bibeholdte, ligesom Legemet iøvrigt paa intet Sted var afbrudt eller defect. Den efterfølgende Beskrivelse tiltrænger derfor i høj Grad at suppleres, ihvorvel den maaske i det væsentlige vil vise sig at være correct.

Endskjønt saaledes Individet mangler et af de for Familien væsentligste Organer, nemlig Sugeskiven, kan det dog paa Grund af Legemets almindelige Bygning ikke betvivles, at det tilhører Liparidernes Familie, medens det ikke er klart, hvilken af de hidtil beskrevne Arter det kommer nærmest.

Til Underslægten *Careproctus*, Kr., kan forhaandenværende Art ikke vel henregnes, uagtet den har det hos denne optrædende betydelige Antal Straaler i Dorsalen og Analen, samt det relativt lille Hoved. Hos *Careproctus reinhardi* ere de mellemste Pectoralstraaler vistnok korte, men dog fuldstændig normalt udviklede; Legemet aftager hos denne Art hurtigt i Højde bag Nakken, og ender i en lang og smal Hale. Hos *L. bathybii* ere de nederste Pectoralstraaler næsten af samme Længde, som de øvre, men adskilte fra disse ved et Mellemrum, der er optyldt af nogle faa og ganske rudimentære Straaler. Legemshøjden er fremdeles den samme omtrent fra Nakken indtil Analens Begyndelse, og senere ligeledes forholdsvis høj lige til henimod Halespidsen, der aftynder jevnt og hurtigt. Endelig findes intet Spor af, at Analaabningen har siddet i kort Afstand fra Sugeskiven, idet Partiet bagenfor det Punkt, hvor denne sidste har siddet, er uskadt indtil henimod Analen; Analaabningen maa saaledes have ligget forholdsvis langt tilbage, maaske næsten henimod Analens Begyndelse.

Det er en Selvfølge, at Charactererne for den nye Art ikke med det forhaandenværende Materiale lade sig tilfredsstillende udvikle. Dog synes Pectoralernes Bygning at være saa væsentlig afvigende fra, hvad der finder Sted hos de øvrige kjendte Liparider, at Oprettelsen af en ny Underslægt vistnok alene af Hensynet hertil kunde forsvares; hertil komme andre mindre væsentlige Afvigelser, ligesom det er sandsynligt, at disse yderligere ville forøges med et fuldstændigere Materiale. For det Tilfælde, at et nyt Slægtsnavn skulde blive nødvendigt, har jeg allerede i den foreløbige Oversigt over Expeditionens Fiske (1878) som et saadant foreslaaet Navnet *Paraliparis*.

surface almost, or depended in loose strips. This proved in several respects most unfortunate; chiefly, however, owing to the peculiar structure of the pectoral fins, which it would have been of considerable interest to have determined. The ventral disk, too, was wanting, but the spot where it occurs could, I think, be detected; and the abdomen having been crushed, the position of the vent cannot be given. Both the eyes, too, were gone, whereas the fin-rays were nearly all perfect; nor did the body proper exhibit any other traces of mutilation. The following description, therefore, stands greatly in need of supplementary revision, though, perhaps, in all essential particulars, it will be found correct.

One of the organs characteristic of the family, viz., the ventral disk, is indeed wanting in the specimen acquired, yet from the general structure of the body there can be little doubt that it belongs to the family *Liparididæ*, whereas it is by no means clear to which of the species as yet described it presents the closest resemblance.

Under the sub-genus *Careproctus*, Kr., the species in question cannot be classed, notwithstanding it is characterised, in common with the species of the former, by a large number of rays in the dorsal and anal fins, and a head proportionately small. In *Careproctus reinhardi*, the intermediate rays in the pectorals, though short, exhibit a development in every respect normal; in this genus, too, the body posterior to the nape decreases rapidly in height, terminating in a long and narrow tail. *L. bathybii* has the lowest of the pectoral rays nearly equal in length with the uppermost, but separated from the latter by a space on which are disposed a few rays, quite rudimentary. Moreover, the depth of the body, is very nearly the same from the nuchal region to the commencement of the anal, the posterior portion likewise being proportionately deep almost to the tip of the tail, which rapidly becomes slender and tenuous. Finally, there was no trace of the vent having been in close proximity to the ventral disk, the region posterior to the point where the latter was situated having been wholly uninjured to within a short distance from the anal fin; hence the vent must lie comparatively far behind, perhaps in close proximity to the anal.

From a specimen in so mutilated a condition, it is obvious that the characters of the new species cannot all of them be accurately determined. Meanwhile, the structure of the pectoral fins is to that extent divergent from that distinguishing the other known forms of the family of Suckers, that, for this reason alone, the introduction of a new sub-genus may be defended; other less important deviations also occur, the number of which will doubtless be found to increase with further examination of perfect examples. To meet the case of a new generic designation becoming needful, I took occasion, in my preliminary report (1878), to suggest the name *Paraliparis*.

Udmaalinger.

Totallængde	208 mm
Længde til Enden af sidste Halehvirvel	189 -
Største Højde ved Begyndelsen af Dorsalen	37 -
Højde ved Begyndelsen af Analen	33 -
Hovedets Længde	37 -
Hovedets største Højde	30 -
Hovedets Tykkelse over Kinderne	24 -
Overkjævens Længde	17 -
Mellemkjævens Længde	13 -
Snudens Længde	10 -
Længdediameter af Orbita	11 -
Hovedets postorbitale Del	17 -
Interorbitalrummets Bredde	17 -
Snudespidsen til Begyndelsen af Dorsalen	42 -
Snudespidsen til Begyndelsen af Analen	70 -
Analen til Halespidsen	138 -
Længste Straale i Dorsalen	22 -
Længste Straale i Analen	22 -
Pectoralstraalernes største Længde	27 -
Caudalens Længde	19 -
Halerodens Højde	2 -

Beskrivelse. *Legemsbygning.* Legemet er temmelig langstrakt, med kort og rundt Hoved, og særdeles bred Pande; dets Højde er størst over Nakken, hvor denne er lig Hovedlængden. Bagenfor Nakken vedbliver Højden omtrent uforandret, indtil over Begyndelsen af Analen; senere aftager den, især i Halepartiets ydre Dele, successive til Halespidsen.

Hovedet indeholdes i Totallængden $5^1/_2$ Gange. Fra Nakken af er Hovedets Profillinie stærkt bøjet, og skraaner jevnt nedad indtil foran Øjnene; herfra gaar Profillinien stejlt ned indtil Mundspalten.

I Totallængden indeholdes:

Legemets Højde, samt Hovedets Længde	5,54
Snudespidsens Afstand fra Dorsalen	4,88.
Snudespidsens Afstand fra Analen	2,92.

Gjællelaagene ere uvæbnede; Bagranden af Praeoperculum ender i en flad Spidse, der imidlertid neppe har været synlig over Huden. Operculum er yderst lidet, og bestaar (eftersom Huden er forsvundet) væsentlig af et kort, noget opadbøjet og krummet Benparti, der er sammensat af 3 smale Benstraaler.

Gjællespalten er beliggende, som hos de øvrige Liparider, højt oppe mod Nakken ovenfor Pectoralerne, og har et Tversnit, der er mindre, end en halv Orbitaldiameter. Gjællehindens Straaler ere 6, der med sine øvre Spidser naa op til Gjællelaagets nedre Rand. De ere forholdsvis lange og krumme, mod Spidsen særdeles tynde, og ende hermed en næsten umærkelig Fortykkelse.

Blot det ene Par Næsebor kan hos det mutilerede Individ med Sikkerhed paavises. Dette er beliggende nær ved Øjets Rand, i omtrent en halv Øjendiameters Afstand fra Mellemkjæven.

Measurements.

Total length	208 mm
Length to termination of last caudal vertebra	189 -
Greatest height at commencement of dorsal	37 -
Height at commencement of anal	33 -
Length of head	37 -
Greatest depth of head	30 -
Thickness of head across the cheeks	24 -
Length of upper jaw	17 -
Length of intermaxillary	13 -
Length of snout	10 -
Longitudinal diameter of orbit	11 -
Postorbital region of head	17 -
Interorbital space	17 -
From tip of snout to commencement of dorsal	42 -
From tip of snout to commencement of anal	70 -
From anal to tip of tail	138 -
Longest ray in dorsal	22 -
Longest ray in anal	22 -
Greatest length of pectoral rays	27 -
Length of caudal	19 -
Depth of tail at base	2 -

General Description. *Structure of the Body.* — Body rather elongate; head short and globular; front remarkably wide; extreme depth at nape, where it is equal to the length of the head; posterior to the nape, the depth continues the same till a little above the anal, from thence steadily diminishing, more especially in the exterior caudal region, to the tip of the tail.

Length of head to total length as 1 to $5^1/_2$; from the nuchal region the marginal line of the head extends in a sharp curve, bending gradually downwards till a little in front of the eyes, and from thence striking off abruptly to the cleft of the mouth.

The total length contains —

Depth of body and length of head	5.54
Distance of snout from dorsal	4.88.
Distance of snout from anal	2.92

No arming on gill-covers; posterior margin of preoperculum terminating in a flat point, which, however, could hardly have been observable above the skin; operculum exceedingly small, consisting (the skin being entirely gone) chiefly of a curved bony part, composed of three narrow osseous rays.

The gill-opening, as in the other Suckers, placed high up towards the nape, its transverse diameter being less than half the length of the orbit. Brancheostegous rays 6, the uppermost points extending to the inferior margin of the gill-cover; these rays are comparatively long and curved, towards the points exceedingly slender, terminating with a scarcely perceptible inspissation.

One pair of nostrils only could be accurately determined in this mutilated specimen; their position is near the margin of the eye, and distant about half the diameter of the orbit from the intermaxillary.

Pseudobranchier ere ikke tilstede. Gjællernes Antal er det normale $3^1/_2$. Det linieformige Infraorbitalben er normalt udviklet.

Orbitae ere forholdsvis store, med Højdediameteren ubetydeligt kortere, end Længden; den sidste indeholdes i Hovedlængden næsten $3^1/_2$ Gange. Interorbitalrummet er fladt eller svagt convext, og næsten lig Hovedets halve Længde. (Øjnene ere, som ovenfor nævnt, hos det undersøgte Individ udfaldne).

Tænderne ere tilstede i Mellemkjæverne og i Underkjæven. De ere yderst fine, og ordnede i regelmæssige, skraatløbende Tværrækker; fortil i Underkjæven findes omtrent 10 Tænder i hver saadan Række.

Skulderbeltet ender oventil i en temmelig spids Torn, der maaske hos det uskadte Individ har vist sig som en lav Knude over Nakken. Det til den indre Rand af Coracoidbenet fæstede ribbenformede Benstykke (Atlas's Hæmapophyse-Del) er efter sin hele Længde smalt, særdeles langt og spidst, og strækker sig lige ned mod Bugranden, uden dog at danne nogen lukket Bue med det tilsvarende paa den anden Side.

Anus's Beliggenhed kan, som tidligere nævnt, ikke med fuld Sikkerhed angives, da Individet er skadet i Bugen. Dog er det sandsynligt, at det har ligget temmelig nær Analen, idet et forholdsvis langt Parti bagenfor (den manglende) Sugeskive er helt, og uden at vise Spor af Analaabning.

Sugeskiven er, som ovenfor nævnt, afreven. Dog antydes dens Beliggenhed ved et Hul paa Bugen noget bagenfor de nedre Pectoralstraaler. Skiven har ikke været særdeles langt fremrykket (saaledes som hos Slægten *Careproctus*), men den nævnte Aabning er forholdsvis liden, og synes at antyde, at det samme har været Tilfældet med Sugeskiven.

Finnerne. Dorsalen begynder lige bagenfor Nakken; dens Afstand fra Snudespidsen indeholdes næsten 5 Gange i Totall. De forreste Straaler ere ufuldkomne Pigstraaler, og særdeles korte og svage, samt have Ansats til at være dobbelte nedtil. Omtrent fra den 7de Straale af ere de alle kløvede til Grunden, eller fuldkommen dobbelte, samt tydeligt articulerede efter hele sin Længde; midt paa Ryggen er Mellemrummet mellem hver Straales Halvdele saa distinct, at de næsten synes at være stillede parvis. Den største Højde har Finnen paa Midten af Halepartiet, hvor Straalerne have en Længde, der er lig Hovedets Længde indtil Øjets Bagrand; dog har sandsynligvis aldrig Finnen kunnet hæve sig til denne Højde. Bagtil aftage Straalerne kun ubetydeligt i Højde, og de ere ved Haleroden efter hele sin Længde tilvoxede Caudalen, samt ere her tættere stillede, end længere fortil. Straalernes Antal er 59; et Tal der ikke er naaet hos nogen hidtil nøjagtigt undersøgt Art af Lipariderness Familie.

Analen, der tæller 51 Straaler, er i Bygning temmelig overensstemmende med Dorsalen, og begynder, (som hos

Pseudobranchiæ not present; normal number of gills $3^1/_2$; the linear infraorbital bone normally developed.

Orbitæ comparatively large, the vertical diameter somewhat less than the transverse; the latter is to the length of the head as 1 to $3^1/_2$ almost. Interorbital surface flat or slightly convex, width nearly equal to half the length of the head. (In the specimen examined both the eyes were gone).

Teeth in intermaxillaries and in lower jaw; they are exceedingly slender and minute, regularly arranged in oblique transverse rows; each row in the anterior part of lower jaw composed of about 10 teeth.

The scapulary arch terminates above in a rather sharp-pointed spine, which, in specimens not mutilated perhaps would appear as a depressed protuberance on the nape. The costal-shaped bone (the hæmapophysis of Atlas) attached to the inner margin of the coracoid is narrow throughout its entire length, and very long and sharp at the point, extending straight down to the margin of the abdomen, without however meeting that on the opposite side, and forming a perfect arch with it.

As before observed, the exact position of the vent cannot be given, the specimen examined having been mutilated in the abdominal region. Probably, however, it is in close proximity to the anal fin, a comparatively extensive portion of the surface posterior to the ventral-disk (wanting in this individual) exhibiting no vestige whatever of an anus.

The ventral disk, as mentioned above, had been torn off. Its position however was clearly indicated by an orifice in the abdominal surface somewhat posterior to the lower pectoral rays. The disk cannot therefore have been very far back (as in the genus *Careproctus*); but the said orifice was comparatively small, denoting apparently that such, too, is the case with the ventral disk.

Fins. — Dorsal commencing in close proximity to the nape; its distance from tip of snout is to total length nearly as 1 to 5. The foremost rays spinous, but exceedingly short and fragile, towards the base inclining to branch. From the 7th ray about, they are all of them double, being cleft to the base, and distinctly articulated throughout their entire length; in the middle of the back the interspace between the halves of each ray is so conspicuous as almost to give these rays the appearance of being arranged in pairs. Greatest depth of the fin in the middle of the tail, where the length of the rays equals the length of the head measured to the posterior margin of the eye; it is not probable however that the fin can be elevated to that extent. The posterior rays, which diminish but slightly in height, are at the base of the tail attached to the caudal throughout their entire length; these terminal rays, too, are more closely arranged. Number of rays 59, — hence exceeding that in any accurately determined species of the family *Liparididæ*.

The anal, furnished with 51 rays, very similar in structure to the dorsal, having at the commencement (as

andre Liparider) med længere Straaler, end de tilsvarende i den nævnte Finne. Straalerne have sin største Længde noget bagenfor Midten, hvor denne er lig de længste Dorsalstraalers. Alle Straaler ere kløvede til Grunden, saa de næsten synes parvis stillede; i Begyndelsen ere de utydeligt, men senere tydeligt articulerede. De ere bagtil tætstillede, samt efter hele sin Længde tilvoxede Caudalen, og ere her omtrent af samme Længde, som de tilsvarende Straaler i Dorsalen.

Caudalen bestaar af 8 Straaler, hvoraf maaske det yderste Par ere enkelte, men alle de øvrige kløvede lige til Grunden. De ere alle yderst spinkle, tætstillede, samt fint articulerede. Af Form er denne Finne noget tilspidset; de mellemste Straaler, (der ere noget kortere, end de længste Dorsal- eller Analstraaler), rage med omtrent $^1/_3$ af sin Længde ud over sin Forbindelse med Dorsalen og Analen.

Pectoralens Bygning er ganske ejendommelig, idet dens øverste og nederste Parti, som tidligere nævnt, ere adskilte ved et Mellemrum, der blot bærer nogle faa rudimentære Straaler. Øverst sidde 13 Straaler, der ere tætstillede, smaa, dobbelte og articulerede; deres største Længde er ubetydeligt større end de længste Dorsalstraaler, men de tør maaske have været afbrudte i Spidsen, og have derfor havt større Længde. Efter disse Straaler følge 3, paa den anden Side 4, rudimentære Straaler, der ende som fine Traade, og hvis Længde ikke overskrider $^2/_3$ af en Orbitaldiameter. Den indbyrdes Afstand mellem hver af disse Straaler er omtrent lig Halvdelen af deres Længde. Nedenfor disse følger Pectoralens nederste Parti, der bestaar af 3 tætstillede, lange Straaler af Bygning ganske som de øverste, og omtrent af disses Længde; alene den nederste er noget kortere, end de øvrige. Overgange fra de rudimentære til de normalt byggede Straaler findes ikke, ligesom Finnen idethele ikke bærer Spor af at være defect i anden Henseende, end at de lange Straaler maaske kunne have været afbrudte i Spidsen.

Forbindelsen mellem disse 3 Partier kan paa Grund af den fuldkommen afrevne Membran ikke angives. Sandsynligvis have de mellemste rudimentære Straaler blot ved Roden været særdeles kort forbundne indbyrdes, ligesom med det øvre og nedre Parti, saaledes at de fine og korte Traade have raget frem over Membranen. Pectoralen faar saaledes et Udseende af at være delt i 2 Dele, hvoraf dets nederste Del, der er nedadrettet og særdeles bevægelig i alle Retninger, har virket som et Par Ventraler, hvis Plads de næsten have indtaget.

Farve, etc. Legemet var særdeles blødt og halvt gjennemsigtigt; Huden overalt graasort, ligesom Mundhulen og Gjællespaltens indre Beklædning; Bughinden gjennemskinnende blaasort. En Række af 3—4 dybe Porer kan sees at strække sig langs Underkjæven.

in all the other genera of the family) somewhat longer rays than the corresponding ones in the latter fin. Greatest length of rays occurring slightly posterior to the medial part, where it equals that of the longest in the dorsal. All the rays cleft to the base, giving them the appearance almost of being arranged in pairs; articulation, indistinct at first, becoming gradually obvious and well-defined. The terminal posterior rays attached to the caudal in their entire length, which is about equal to that of the corresponding rays in the dorsal.

Caudal composed of 8 rays, the two outermost perhaps undivided, all the rest cleft to the base. They are exceedingly slender, close, and finely articulated. Form of the fin somewhat tapering; the medial rays (a trifle shorter than the longest in the dorsal or anal) project to a distance equalling about one-third of their length beyond the tips of the dorsal and anal.

The structure of the pectorals is highly characteristic, the upper and lower parts of these fins, as mentioned above, being separated by a space over which are dispersed a few rudimentary rays only. The upper division furnished with 13 rays, closely arranged, slender, branched, and articulated; greatest length slightly exceeding that of the longest in the dorsal; possibly, however, the points were broken off, in which case the actual length would be somewhat greater. Next to these rays occur 3 — on the opposite side 4 — rudimentary, terminating in membranous filaments, their length not exceeding two-thirds of the diameter of the orbit. The relative distance between these rays about equal to half their length. Immediately beneath them extends the lower division of the pectoral, composed of 3 long and closely arranged rays, in structure precisely similar to the uppermost, and of about the same length, the lowest ray being a trifle shorter than the other two. No transition stages from the rudimentary rays to those of normal structure, nor did the fin itself exhibit the slightest trace of mutilation other than that the points of the long rays might possibly have been broken off.

The exact connexion between these three divisions of the fin could not be determined, the membrane uniting them having been torn off. Probably, however, the medial rudimentary rays are connected with one another, as also with the upper and lower divisions, at the base alone, in such manner that the short and slender connective filaments project beyond the membrane. Hence the pectorals have the appearance of being divided in two, of which the lower half, inclining downwards and having great freedom of motion, performs the office of ventrals, indeed almost supplying the place of those fins.

Colour &c. — The body, in the specimen examined, was exceedingly soft, and semi-transparent; skin greyish-black, also that covering the cavity of the mouth, and the inner branchial integument; abdominal membrane a translucent bluish black. Three or four deep pores, distinctly obvious, extending along the lower jaw.

Individet var en Hun, med Ovarierne fulde af moden Rogn. Rognkornene, hvis Antal var omtr. 100, have en betydelig Størrelse, næsten som en Lindsediameter (deres Tversnit er 4,5mm). Foruden disse Æg, der sandsynligvis vare gydefærdige, fandtes som sædvanligt et stort Antal, der vare forblevne uudviklede. Artens Gydetid falder saaledes i Sommermaanederne.

Føde. Ventrikelen var særdeles stærk og musculøs, og indeholdt Levninger af *Themisto libellula*, Mandt. samt Dele af en stor Myside; desuden fandtes Laaget og Dele af Kappen af en liden Gasteropode, der synes at have været en *Natica*.

Udbredelse. Individet optoges, som ovenfor nævnt, fra det iskolde Vand (Temperaturen — 1,2° C.), og fra en betydelig Dybde (658 Favne, eller 1203m) i Havet vestenfor Beeren Eiland, og er det eneste hidtil bekjendte Exemplar af sin Art.

Gen. Careproctus, Kr.

Naturh. Tidsskr. 3 R. 1 B. p. 253, Kbhvn. 1861—63 (1862).

Som Slægten Liparis, men Legemet har langt og tyndt Haleparti, og særdeles spinkle Straaler. Sugeskiven særdeles liden, ligger langt fortil, lige under Øjets forreste Del. Anus langt fremrykket, ligger i kort Afstand fra Sugeskiven. Pectoralerne strække sig fremad indtil hen imod Underkjævens Spidse. Tænderne danne uregelmæssige Rækker, ere svagt rummede, og uden Flige.

14. Careproctus reinhardi, Kr. 1862.

Pl. II, Fig. 15—16.

Liparis gelatinosus, Reinh. (ex Pall.) Overs. 1842, Kgl. D. Vid. Selsk. Nat. Math. Afh. p. LXXVII, Kbhvn. 1843 (1842).
? *Liparis gelatinosus*, Günth. Cat. Fish. Brit. Mus. vol. 3, p. 163 (1861).
Liparis (Careproctus) reinhardi, Kr. Naturh. Tidsskr. 3 Række, 1 B. p. 252, Kbhvn. 1861—63 (1862).
Careproctus reinhardi, Gill, Proc. Acad. Nat. Sci. Philad. 1864, p. 194 (1864).

Diagn. *Hovedet kort og rundt, indeholdes 4—5 Gange i Totallængden. Øjnene indeholdes hos yngre Individer 4—5, hos de ældre omtrent 6 Gange i Hovedets Længde. Caudalen særdeles spinkel, ved Roden bedækket af Dorsalen og Analen. Overkjæven næsten af samme Længde, som Underkjæven. Sugeskiven har en Størrelse af blot lidt over en*

This individual was a female, with the ovaries full of mature roe; the ova, in number about 100, were of considerable size, their longitudinal diameter being equal to that of the lens (transverse diameter 4.5mm). Exclusive of these ova — probably ready for depositing — the ovaries likewise contained a large quantity of undeveloped roe. Hence the species spawns in the summer months.

Food. — In the ventricle, exceedingly strong and muscular, were divers remains of *Themisto libellula*, Mandt, together with fragments of a large Myside; also the operculum and parts of the mantle of a small Gasteropod, apparently belonging to the genus *Natica*.

Distribution. — As before stated, this individual was taken at a considerable depth (658 fathoms, = 1203m), in the open sea, west of Beeren Eiland, the temperature of the water being — 1.2° C., and is the only example of its species yet obtained.

Gen. Careproctus, Kr.

Naturh. Tidsskr. 3 R. 1 B. p. 253, Kbhvn. 1861—63 (1862).

Closely resembling the genus Liparis, but with the caudal region long and tenuous, and the fin-rays exceedingly slender. The ventral disk exceedingly small, placed far in front, immediately beneath the anterior portion of the eye. The vent far in advance, in close proximity to the ventral disk. The pectorals extending forwards to the symphysis of the lower jaw. The teeth, arranged in irregular rows, are slightly curved, and simple.

14. Careproctus reinhardi, Kr. 1862.

Pl. II, fig. 15—16.

Liparis gelatinosus, Reinh. (ex Pall.) Overs. 1842, Kgl. D. Vid. Selsk. Nat. Math. Afh. p. LXXVII, Kbhvn. 1843 (1842).
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Careproctus reinhardi, Gill, Proc. Acad. Nat. Sci. Philad. 1864, p. 194 (1864).

Diagnosis. — *Head short and globular, its length compared to total length being as 1 to 4—5. The diameter of the eye, in young individuals, is to the length of the head as 1 to 4—5, in adults, about as 1 to 6. The caudal fin exceedingly slender, covered at the base by the dorsal and anal. The upper jaw nearly equal in length to the lower.*

Øjendiameter. Pectoralen nedtil indskaaren; de nedre Straaler i Spidsen fri, og danne (hos yngre) korte, snoede Traade. Anus i en Øjendiameters Afstand (eller kortere) bag Sugeskiven. Huden slimet og gelatinøs, Legemet halvt gjennemsigtigt. Farven rødgraa eller hvidlig. Størrelsen indtil 79mm (Nordh. Exped.), eller 150mm (Mus. Hafn.).

M. B. 6. D. 54—55; A. 45—46; C. 11—14; P. 32—33.

Localit. fra Nordh.-Exped. Jan Mayen; Havet vestenfor Beeren Eiland.

	Stat. 237.	*Stat. 312.*
Beliggenhed.	Jan Mayen.	108 Kilom. V. Beeren Eiland.
Dybde.	263 Favne (481m).	658 Favne (1203m).
Temp. paa Bunden.	— 0,3° C.	— 1,2° C.
Bunden.	Vulcansk Grus, Lava.	Brunt og grønt Ler.
Datum.	3die Aug. 1877.	22de Juli 1878.
Antal Indiv.	1 Indiv.	2 Indiv.

Bemærkninger til Synonymien. Ihvorvel denne Art i sit ydre Habitus har den typiske Slægt *Liparis'* almindelige Bygning, vil den dog med nogen Ret kunne udsøndres fra denne paa Grund af Afvigelser saavel i den indre, som ydre Bygning. Dette har allerede Krøyer paa ovenanførte Sted (1862) antydet; og skjønt han ikke endnu har villet gjennemføre denne Forandring i sin Helhed, opstiller han dog det nye Slægtsnavn *Careproctus* som en Benævnelse, der vil kunne anvendes, naar senere Undersøgelser have fundet dette nødvendigt.

Disse Afvigelser fra den typiske Slægt *Liparis* ere væsentlig, som ovenfor angivet, den stærkt reducerede Sugeskive og dennes Stilling, Pectoralernes Bygning, samt Beliggenheden af Anus. Idethele vil *C. reinhardi* i de Stadier, hvori Arten hidtil er kjendt, ikke let kunne forvexles med nogen af de nordeuropæiske eller hidtil bekjendte grønlandske Liparider.

Hvorvidt imidlertid forhaandenværende Art er specifik skilt fra den af Pallas allerede i forrige Aarhundrede beskrevne kjæmpemæssige *Cyclopterus gelatinosus* fra Kamtschatka, der, ifølge Beskrivelsen, har en lignende ubetydeligt udviklet Sugeskive, og langt fremrykket Anus, er endnu ikke bleven positivt bekræftet, men flere Grunde tale for begge Formers Adskillelse.

Da Reinhardt i 1842 for Videnskabs-Selskabet i Kjøbenhavn omtalte de fra Grønland nedsendte Individer, der udgjøre Typerne for den senere *Careproctus reinhardi*, og som efter hans Mening besad de af Pallas omtalte Ejendommeligheder, antog han dem for synonyme, og opførte Arten som *Liparis gelatinosus*, Pall.; men Krøyer har, som det synes med Rette, betvivlet deres Identitet, og opstillede

The diameter of the ventral disk but slightly exceeding that of the eye. The pectorals deeply notched; their inferior rays free at the points, constituting (in young examples) a series of short, twisted filaments. The vent placed one eye-diameter (or less) behind the ventral disk. Skin viscid and glutinous; body semi-transparent. Colour reddish-grey or whitish. Length reaching 79mm (North Atl. Exped.); 150mm (Mus. Hafn.).

M. B. 6. D. 54—55; A. 45—46; C. 11—14; P. 32—33.

Locality (North Atl. Exped.): — Jan Mayen; the open sea west of Beeren Eiland.

	Stat. 237.	*Stat. 312.*
Exact Locality.	Jan Mayen.	108 Kilom. W. Beeren Eiland.
Depth.	263 Fathoms (481m).	658 Fathoms (1203m).
Temp. at Bottom.	— 0.3° C.	— 1.2° C.
Bottom.	Volcanic Rubble.	Brown and Green Clay.
Date.	3rd Aug. 1877.	22nd July 1878.
Numb. of Specim.	1 Indiv.	2 Indiv.

Remarks on the Synonymy. — This species, notwithstanding its striking resemblance to the typical genus *Liparis*, may, by reason of divers peculiarities of structure, both external and internal, be safely regarded as distinct. To this fact Kröyer, as stated above, has already drawn attention, in the Naturh. Tidsskr. 3rd Series (1862); he has not, however, as yet wholly adopted the change, but suggests the generic name of *Careproctus*, which, when subsequent researches shall have shown the need of a new designation, will, he opines, prove appropriate.

The salient characters distinguishing *Careproctus* from the typical genus *Liparis* are, as enumerated above, chiefly the greatly reduced dimensions of the ventral disk, and its position, the structure of the pectorals, and the position of the vent. Indeed there is little probability of confounding this species with any one of the various forms inhabiting the shores of Northern Europe, or of those as yet met with in the Greenland seas.

Meanwhile, whether the form in question be specifically distinct from the gigantic *Cyclopterus gelatinosus* inhabiting the coast of Kamtschatka, described in the last century by Pallas, according to whose diagnosis it is similarly characterised by the slight development of the ventral disk and the advanced position of the vent, has not yet been finally determined; but there is much to urge in favour of specific distinction.

Reinhardt, who, in 1842, at a Meeting of the "Videnskabs-Selskabet" of Copenhagen, called attention to the individuals sent from Greenland, — the types of *Careproctus reinhardi*, afterwards established, and which, as he conceived, exhibit the characteristic features mentioned by Pallas, — regarded them as identical, and referred the species to *Liparis gelatinosus*, Pall.; but Kröyer has seen fit, and

derfor i 1862 de samme Individer, der iøvrigt vare yderst slet vedligeholdte, som ovenfor nævnt under Navnet *Liparis (Careproctus) reinhardi*. Indtil nye og authentiske Undersøgelser af Pallas' Art foreligge, vælger jeg derfor, ligesom Krøyer, at betegne "vor" Art med den af den sidstnævnte Naturforsker givne Benævnelse, der er den første, der utvivlsomt vedkommer denne Art.

Det kan i denne Forbindelse nævnes, at Prof. Peters i Pallas's *Liparis gelatinosus*, (der iøvrigt er opstillet efter et slet og tørret Exemplar), ser blot de senere Forfatteres *L. fabricii*, og han opstillede derfor alle de under Germania- og Hansa-Expeditionen ved Øst-Grønland i 1870 og 71 indsamlede Individer under denne Pallas's Art, under hvilken som Synonym opføres baade *L. tunicatus*, Reinh., og *L. fabricii*, Kr. (2te Deutsche Nord-Polarfahrt, II, Saügeth. und Fische, p. 171).

Blandt de atlantiske Liparider kommer iøvrigt Slægten *Careproctus* vistnok nærmest denne saakaldte *Liparis fabricii*, der synes at have tilfælles med *Careproctus* det høje og stumpe Hoved, og den i Størrelse noget reducerede Sugeskive. *L. fabricii*, der maaske blot vil vise sig at udgjøre Ungformen af de senere Forfatteres *L. tunicatus*, er imidlertid fuldstændig adskilt ved sin forholdsvis korte og plumpe Form, og fremfor alt ved Stillingen af Anus, der hos denne Art ikke afviger væsentlig fra det typiske hos Slægten *Liparis*. (Denne Art erholdtes ikke under Nordhavs-Expeditionen).

Bemærkninger til Beskrivelsen. Arten er af Krøyer (Naturh. Tidsskr. 3 Række, 1 B. 1862) udførligt bleven beskrevet, saaledes at der nedenfor blot meddeles et Par supplerende Bemærkninger. Det characteristiske for denne mærkelige Form er Sugeskiven, der er saa overordentlig reduceret i Størrelse, at den kun bliver ubetydeligt større, end Øjendiameteren. Den er fremdeles saa langt fremrykket, at den har sit Leje lige mellem Pectoralernes forreste Ende, og næsten skjult af disses Straaler.

Umiddelbart bagenfor Sugeskiven, i neppe over en Øjendiameters Afstand fra denne, ligger Analaabningen, der er fjernet omtrent ligesaa langt fra Analfinnen, som fra Snudespidsen. Denne abnorme Stilling har selvfølgelig ogsaa sin Indflydelse paa Anordningen af Indvoldenes Leje og deres Form.

Halen er særdeles lang og tynd. Ved Sammenligning af alle Nordhavs-Expeditionens 3 Individer, hvis Størrelse ligger mellem 56 og 79^{mm}, fremgaar det, at Halepartiet tiltager stærkere under Legemets fremadskridende Væxt, end de øvrige Legemsdele. Saaledes indeholdes Hovedlængden hos det mindste Individ ikke fuldt 4 Gange, hos det største næsten 5 Gange i Totallængden, Legemshøjden hos det mindste noget over $4^1/_2$ Gange, hos det største over 6 Gange i Totallængden.

Øjnene ere forholdsvis store, og indeholdes knapt 4 Gange i Hovedets Længde. Blot 1 Par Næsebor kan sees paa de foreliggende Exemplarer; disse ere ikke forsynede med Tuber.

apparently with good reason, to question their identity, and hence he classed, as previously stated, in 1862, the same specimens (in a bad state) under the name of *Liparis (Careproctus) reinhardi*. Till new individuals of Pallas's species shall have been procured and carefully examined, I prefer, with Kröyer, to designate the species in question by the appellation that naturalist suggests, — the first unquestionably referring to this species.

In connexion with this subject it may not be out of place to remark that Professor Peters regards Pallas's *Liparis gelatinosus* (which was established from a dried and defective specimen) as identical with the *L. fabricii* of later authors, and he has therefore referred all of the individuals collected on the "Germania" and "Hansa" Expeditions off the east coast of Greenland to that species, including both *L. tunicatus*, Reinh. and *L. fabricii*, Kr. as synonyms (Zweite Deutsche Nord-Polarfahrt, II, p. 171).

Of the Atlantic Liparides, the genus *Careproctus* resembles on the whole the so-called *Liparis fabricii*, having in common with that species the head deep and obtuse and the ventral disk somewhat reduced in size. But *L. fabricii*, which possibly will prove to be merely the immature form of the *L. tunicatus* of subsequent authors, is nevertheless perfectly distinct, as seen by its comparatively short and clumsy body, more especially however by the position of the anus, which in this species deviates but little from that typically characteristic of the genus *Liparis*. (No specimen of this species was taken on the Expedition).

Descriptive Observations. — Of this species, a detailed description has been furnished by Kröyer (Naturh. Tidsskr. 3 Række, 1, B. 1862), and hence but a few supplementary observations are here subjoined. The characteristic feature distinguishing this very peculiar form is the ventral disk, of so reduced dimensions that its diameter scarcely exceeds that of the eye. Moreover, it is placed so far in advance as to give it a position between the anterior extremities of the pectorals, by the rays of which it is almost hidden.

Not more than an eye-diameter posterior to the ventral disk is the vent, at about the same distance from the anal fin as from the point of the snout. This abnormal position, too, cannot but influence the arrangement and form of the intestines.

Tail very long and tenuous. On comparing together the three specimens obtained on the North Atlantic Expedition, of dimensions ranging from 56^{mm} to 79^{mm}, it was manifest that, as the growth of the body progresses, the caudal region develops more rapidly than do the other parts. Thus, the length of the head, in the smallest example, was not quite one-fourth, in the largest, nearly one-fifth of the total length; the proportion of the depth of the body to the total length, in the smallest example, slightly exceeded that of 1 to $4^1/_2$, in the largest that of 1 to 6.

Eyes comparatively large, rather more than one-fourth of the length of the head. Only one pair of nostrils can be discerned in the specimens examined; they are not furnished with tubes.

De erholdte Individer havde følgende Maal:

	Total-længde.	L. uden Caudal.	Hovedets Længde.	Legemets Højde.
a. (*Stat.* 237)	56 mm	52 mm	15 mm	12 mm
b. (*Stat.* 312)	62 -	56 -	15 -	12,5 -
c. (*Stat.* 312)	79 -	73 -	16 -	13 -

I Totallængden indeholdes saaledes:

a.	Hovedets Længde	3,73;	Legemets største Højde	4,66.
b.	— —	4,13;	— — —	4,96.
c.	— —	4,93;	— — —	6,07.

Finnestraalerne ere særdeles bløde og spinkle, temmelig fast nedtrykte mod Legemet, og kunne neppe nogensinde rejses til sin fulde Højde. De ere tillige saaledes indhyllede i den bløde og slimede Hud, der bedækker Legemet, at de ikke, uden at Exemplaret delvis ødelægges, kunne tælles, og selv da kun med Vanskelighed. Straaleantallet hos Individ *a* syntes at være følgende: D. 55; A. 45; P. 33; C. 14. Hos Individ *c* var der mindst 52 Straaler i Dorsalen.

Analen og Dorsalen bedække bagtil omtrent det halve af den temmelig korte og spinke Caudal, og uden at Analen rager længere tilbage, end Dorsalen.

Pectoralerne have sit Udspring lige foran paa Struben, umiddelbart mellem Underkjævernes Symphyse, og støde her ganske tæt sammen, uden dog, som det synes, at være helt sammenvoxne fortil. De forreste 8—10 Straaler ere lidt forlængede, og rage som korte snoede Traade ud over Membranen; herved dannes maaske et mere udviklet Føleorgan, end hos de øvrige Liparider. Finnens mellemste og største Del har lave Straaler, den øvre Del atter forlængede. Den hele Finne danner en halvcirkelformig Bue langs Hovedets Underside, og følger næsten nøjagtigt den Linie, som den nedre Rand af Operculum og Suboperculum danne.

Farven er blegt rødgraa eller hvidagtig, uden Tegninger eller Baand; under Forstørrelse viser den sig at være dannet af yderst smaa, sorte Punkter, der dog staa saa jevnt fordelte, at de blot tildels give Rygsiden en ubetydeligt mørkere Skygning, men ikke danne Pletter. Iris var i levende Live violet.

Hele Legemet er iøvrigt indhyllet i en løs, klæbrig, næsten gelatinøs Hud, ligesom hele Legemet er af en løs og halvt transparent Consistents, skjønt alle Individer bleve satte levende paa stærk Alcohol.

Føde. I Ventrikelen af det mindste Exemplar (fra Jan Mayen) fandtes blot et Stykke af en Kalksvamp; sandsynligvis har der paa det afbidte Stykke siddet et eller andet lidet Dyr.

Udbredelse. Idet vi altsaa gaa ud fra, at Nordhavs-Expeditionens Individer ere identiske med de 2 Typ-Exemplarer fra Grønland, der ere beskrevne under Navnet *Careproctus reinhardi*, foreligger Arten, fraregnet alle usikre Synonymer, for det første, fra de rent arctiske

The examples measured as follows: —

	Total Length.	L. excl. Caudal.	Length of Head.	Depth of Body.
a. (*Stat.* 237)	56 mm	52 mm	15 mm	12 mm
b. (*Stat.* 312)	62 -	56 -	15 -	12.5 -
c. (*Stat.* 312)	79 -	73 -	16 -	13 -

Hence the total length contains —

a.	Length of Head	3.73;	Greatest D. of Bdy.	4.66.
b.	— - —	4.13;	— - - - —	4.96.
c.	— - —	4.93;	— - - - —	6.07.

Fin-rays exceedingly soft and slender, rather firmly pressed against the body, and rarely if ever admitting of being raised to their full height. Moreover, wholly enveloped as they are in the soft and viscid membrane covering the body, they cannot be counted, except by mutilating the specimen, nor even then without difficulty. The number of fin-rays in example *a* was apparently as follows: — D. 55; A. 45; P. 33; C. 14. In example *c*, the dorsal was furnished with at least 52 rays.

The anterior half of the somewhat short and slender caudal is almost covered by the anal and dorsal, — and without the anal extending farther back than the latter fin.

The pectorals commence far forwards on the throat, immediately between the symphysis of the lower jaw, approximating, but without, it seems, being strictly contiguous at their origin. The foremost 8 or 10 rays slightly elongated, projecting beyond the membrane, as short, spiral-shaped filaments; by this peculiarity of structure the species, perhaps, is furnished with a more delicate organ of touch than are any of the other Liparides. The intermediate and largest portion of the fin has short rays, the upper is elongated. The entire fin, semi-circular in form, extends along the under surface of the head, and almost exactly in a line with the lower margin of the operculum and suboperculum.

Colour pale reddish-grey or whitish, no bands or markings of any kind; a microscopic examination shows it to be produced by a multitude of exceedingly minute black maculæ, in distribution, however, so uniform as merely to give the upper surface a slightly darker shade; spots there are none. Irides, in the living specimen, violet.

For the rest, the whole body is enveloped in a lax, viscid, almost glutinous membrane, the body itself being semi-transparent, and of a jelly-like consistency, notwithstanding the specimens were all of them, while yet living, immersed in proof-spirits.

Food. — The ventricle of the smallest example (from Jan Mayen) contained only a small portion of a calcareous sponge; probably there had been some small animal on the fragment bitten off.

Distribution. — Assuming, therefore, the individuals taken on the North Atl. Expedition to be identical with the two typical specimens from Greenland, described under the name *Careproctus reinhardi*, this species — disregarding all doubtful synonyms — is known to inhabit the Arctic waters

Farvande, nemlig Grønland, Jan Mayen, og Beeren Eiland. Men sandsynligvis er dens Udbredelse betydeligt større, endskjønt den paa Grund af sine Finners Bygning maa antages at have en ringe Bevægelighed, og saaledes idethele at være særdeles stationær, og den optræder derfor utvivlsomt ogsaa paa Havbunden overalt paa passende Localiteter imellem de nævnte Landsdele.

I afvigte Høst (1879) havde jeg, ved Prof. Smitts Imødekommen, Lejlighed til at undersøge de under „Gunhild“s Expedition Sommeren 1879 udenfor Arendal i Norge optagne Fiske, der, uden endnu at være nøjere undersøgte, opbevaredes i Riks-Musæum i Stockholm. Blandt disse fandtes 4 særdeles vel conserverede Exemplarer af denne Art, optagne fra 350—370 Favnes Dyb (under 58° N. B.); det maa derfor antages, at den heller ikke vil savnes paa Dybderne udenfor den øvrige Del af den norske Kyst. De sidstnævnte Individer, hvis Totallængde varierede mellem 56 og 63^{mm}, afvege i ingen Henseende fra Individerne fra Jan Mayen og Beeren Eiland (cfr. Forh. Vid. Selsk. Chra. 1880, No. 8).

Arten er utvivlsomt blandt Lipariderne en Dybvandsform, og kan, som ovenfor nævnt, trænge ned idetmindste til mellem 6 og 700 Favnes Dyb, hvor den i Regelen bebor det iskolde Vand, hvis Temperatur kan gaa ned til — 1° C. og derunder. Flere end de Individer, der ere omtalte i de ovennævnte Bemærkninger, synes ikke at være hidtil erholdte.

of the globe, viz. the coasts of Greenland, Jan Mayen, and Beeren Eiland. Probably, however, it has a more extended range of distribution, although, by reason of the structure of the fins, it may be regarded as possessing but limited powers of locomotion, and in consequence, on the whole, as stationary in its habits; it occurs, too, no doubt at the bottom of the ocean in all favourable localities between the aforesaid regions.

Last autumn (1879) Professor Smitt kindly afforded me an apportunity of examining the fishes taken on the "Gunhild" Expedition, in the summer of 1879, off Arendal, in Norway, which, without having been specially examined, were preserved in the Riks Museum at Stockholm. Amongst the fishes obtained on that occasion were 4 good examples of this species, brought up from a depth of 350—370 fathoms (lat. 58° N.); and hence we may safely assume, that it will not be found wanting in the depths off the remainder of the Norwegian coast. The specimens in question, whose extreme length ranged between 56^{mm} and 73^{mm}, differed in no wise from the individuals obtained from the shores of Jan Mayen and Beeren Eiland.

This species is unquestionably a deep-sea form of the *Liparididæ*, and, as stated above, can descend at least 600—700 fathoms below the surface, inhabiting as a rule the frigid depths, where the temperature of the water can be as low as, and even lower than, — 1° C. The specimens mentioned here would appear to be the only examples of the species as yet obtained.

Fam. Blenniidae.

Gen. Lumpenus, Reinh.

Overs. 1835—36, Kgl. D. Vid. Selsk. Nat. Math. Afh. 6te Del, p. CX, Kbhvn. 1837 (1835—36).

Legemet særdeles langstrakt, beklædt med smaa Skjæl. Sidelinie tilstede, men utydelig. Tænder altid i Kjæverne, undertiden tillige paa Vomer og paa Palatinbenene, eller paa et enkelt af disse Ben. Snuden kort. Dorsalen lang, ligesom Analen; den første dannet udelukkende af Pigstraaler. Caudalen distinct (undertiden ved en Membran delvis forenet med Dorsalen og Analen). Ventralerne temmelig korte og spinkle, siddende foran Pectoralerne. Gjællespalten vid; Gjællehinderne ere sammenvoxede over Isthmus, uden dog at danne nogen fri Fold. Gjællestraalerne 6. Pseudobranchier tilstede, ligesom Appendices pyloricae; Svømmeblære mangler.

Fam. Blenniidæ.

Gen. Lumpenus, Reinh.

Overs. 1835—36, Kgl. D. Vid. Selsk. Nat. Math. Afh. 6te Del, p. CX, Kbhvn. 1837 (1835—36).

Body exceedingly elongated, covered with minute scales. Lateral line present, but indistinct. Teeth in jaws; sometimes on the vomer and the palatine bones, or on one of these bones only. Snout short. Dorsal, like the anal, long; the former composed exclusively of spinous rays. Caudal distinct, sometimes united to dorsal and anal by a connective membrane. Ventrals short and slender, anterior to the pectorals. Gill-aperture wide, branchial membranes continuous across the isthmus, without however producing a free fold. Branchiostegous rays 6. Pseudobranchiæ and pyloric appendages present; swimming-bladder wanting.

15. **Lumpenus medius**, Reinh. 1838.

Pl. II, Fig. 17.

Lumpenus medius, Reinh. Overs. 1835—36, Kgl. D. Vid. Selsk. Naturv. Math. Afh. 6. Del, p. CX (Kbhvn. 1837). Uden Beskrivelse eller Diagnose.
Clinus medius, Reinh. Kgl. D. Vid. Selsk. Naturv. Math. Afh. 7. Del, p. 114 og 121 (Kbhvn. 1838).
Stichaeus medius, Günth. Cat. Fish. Brit. Mus. vol. 2, p. 281 (1861).
Anisarchus medius, Gill, Proc. Acad. Nat. Sci. Philad. 1864, p. 210 (1864).
Lumpenus medius, Malmgr. Öfv. Kgl. Vet. Akad. Förh. 1864, p. 517 (1864).

Diagn. *Tænder i Kjæverne og paa Palatinbenene, ingen paa Vomer. Hovedet indeholdes hos de yngre $5^1/_4$, hos de ældre indtil 6 Gange i Totall. Kjæverne omtrent lige lange, naa tilbage til Øjets Forrand. Pectoralerne afrundede, kortere end Hovedet, indeholdes 8 Gange i Totall. Caudalen ægformig afrundet, ved Roden forbundet ved en Membran med Analen og Dorsalen. Analen tiltager i Højde bagover. Legemets Længde foran Anus forholder sig til Halepartiet, som 1:1,4. Farven gulagtig, næsten uden Pletter, eller med enkelte svagtbegrændsede Pletter paa Legemet og paa Dorsalen. Appendices pyloricae 4. Størrelsen indtil 140*mm.

M. B. 6. D. 61—62 (60 eller 63); A. 41—42 (40 eller 43); P. 14 (13 eller 15); V. 4; C. 2/17/2.

Localit. fra Nordh. Exped. Spitsbergen.

	Stat. 366.	*Stat.* 374.
Beliggenhed.	Magdalenebay, Nord-Spitsbergen.	Adventbay, Vest-Spitsbergen.
Dybde.	50 Favne (91m).	60 Favne (110m).
Temp. paa Bunden.	— 1,0° C.	+ 0,7° C.
Bunden.	Mørkegraat Ler.	Mørkt Ler.
Datum.	17de Aug. 1878.	22de Aug. 1878.
Antal Indiv.	4 Indiv.	3 Indiv.

Bemærkninger til Synonymien. I Aarsoversigten for 1835—36 af Forhandlingerne i Det kgl. D. Vid. Selsk. (aftrykt i 5te Del, 1837) blev Slægtsnavnet *Lumpenus* tildelt en Gruppe af Blenniider fra de grønlandske Have, for hvilken Müller's *Blennius lumpenus* (Zool. Dan. Prodr. p. IX, 1776, senere af Fabricius nøjagtigt beskreven i hans Fauna Groenl. 1780), var Typen, og som af Reinhardt paa det anførte Sted benævnedes *Lumpenus fabricii;* til samme Gruppe henførte han yderligere 2 nye, i Kjøbenhavns Musæum opbevarede Arter, nemlig *L. medius* og *L. aculeatus*, dog uden paa dette Sted at anføre disse nye Arters Diagnoser.

Den vigtigste af de paa det anførte Sted meddelte Characterer for denne Slægt var den utydelige Sidelinie, den paa Struben „fri" Gjællehud, hvori fandtes 6 Straaler, foruden Tilstedeværelsen af Tænder paa „Plovskjærbenet",

15. **Lumpenus medius**, Reinh. 1838.

Pl. II, fig. 17.

Lumpenus medius, Reinh. Overs. 1835—36, Kgl. D. Vid. Selsk. Naturv. Math. Afh. 6. Del p. CX (Kbhvn. 1837). No description or diagnosis.
Clinus medius, Reinh. Kgl. D. Vid. Selsk. Naturv. Math. Afh. 7. Del, p. 114 and 121 (Kbhvn. 1838).
Stichæus medius, Günth. Cat. Fish. Brit. Mus. vol. 3, p. 281 (1861).
Anisarchus medius, Gill, Proc. Acad. Nat. Sci. Philad. 1864, p. 210 (1864).
Lumpenus medius, Malmgr. Öfv. Kgl. Vet. Akad. Förh. 1864, p. 517 (1864).

Diagnosis. — *Teeth in jaws and on palatine bones, wanting on vomer. Length of head to total length, in young examples, as 1 to $5^1/_4$, in adults, as 1 to 6. Jaws about equal in length, reaching back to the anterior margin of the eye. Pectorals rounded, shorter than head, length to total length as 1 to 8. Caudal truncate, at base united by a connective membrane to the anal and dorsal. The anal increases in depth towards the posterior extremity. Length of body anterior to vent is to that of the tail as 1 to 1.4. Colour yellowish, almost without spots; a few only, faintly defined, occurring on the body and the dorsal fin. Pyloric appendages 4. Length reaching 140*mm.

M. B. 6. D. 61—62 (60 or 63); A. 41—42 (40 or 43); P. 14 (13 or 15); V. 4; C. 2/17/2.

Locality (North Atl. Exped.): — Spitzbergen.

	Stat. 366.	*Stat.* 374.
Exact Locality.	Magdalene Bay, North Spitzbergen.	Advent Bay, West Spitzbergen.
Depth.	50 Fathoms (91m).	60 Fathoms (110m).
Temp. at Bottom.	— 1.0° C.	+ 0.7° C.
Bottom.	Dark-grey Clay.	Dark Clay.
Date.	17th Aug. 1878.	22th Aug. 1878.
Numb. of Specim.	4 Indiv.	3 Indiv.

Remarks on the Synonymy. — In the annual review of Danske Videnskabernes Selskab for 1835—36, (printed in Part 5, 1837), the generic name of *Lumpenus* was given to a group of *Blenniidæ* occurring on the coast of Greenland and in the waters adjacent, Müller's *Blennius lumpenus* (Zool. Dan. Prodr. p. IX, 1776), of which Fabricius a few years afterwards (1780) furnished a full description, in his Fauna Grœnlandica, serving as the typical form; by Reinhardt this species is designated *Lumpenus fabricii.* In the same group he further comprised *L. medius* and *L. aculeatus*, two new species, examples of which were preserved in the Zoological Museum at Copenhagen, without however giving any diagnosis of the species.

The chief generic characters enumerated by the author were as follows: — lateral line indistinct; branchiostegous membrane "free" on the throat, and furnished with 6 rays; teeth on the "Plovskjærbenet" (ploughshare-bone, i. e,

hvilket Udtryk Reinhardt senere i sin Afhandling om de grønlandske Fiske (1838) rettede som en Tryk- eller Skrivfejl til „Ganebuerne“. Paa dette sidste Sted omhandler han atter Grupperingen af denne Slægt, og samler Arterne i 3 Grupper eller Underslægter, der dog ikke gives særskilte Benævnelser, under Cuviers Slægtsnavn *Clinus*. Denne Gruppering, der er baseret udelukkende paa Tandforholdene, bør vistnok ogsaa bibeholdes, saafremt man i Virkeligheden finder det fornødent yderligere at inddele denne Slægt.

I den første Afdeling sammenstiller Reinh. (i 1838) fremdeles de 2 Arter *Clinus lumpenus (ɔ: Lumpenus fabricii)*, og *Clinus medius*; da det derimod havde vist sig, at *Clinus aculeatus* tillige havde Tænder paa Vomer, blev denne Art stillet i 2den Gruppe; den 3die Gruppe dannedes endelig af *Clinus gracilis*, en ny Art, der blot havde Kjævetænder, men ingen Tænder paa Vomer og Palatinbenene.

Udskillelsen af de til *Lumpenus*-Gruppen henhørende Arter under særskilt benævnede Slægter er først bleven gjennemført af Gill, der i sin Catal. over Fiskene paa Nord-Americas Nordostkyst (Proc. Acad. Nat. Sci. Philad. 1861), og senere i sin Oversigt over Familien *Stichaeidae* (samme Tidsskr. for 1864) henførte de 6 af ham nævnte Arter fra dette Gebet under ikke mindre end 5 forskjellige Slægter. Af disse bør dog utvivlsomt idetmindste de 2, nemlig *Anisarchus* og *Centroblennius*, inddrages, da de Characterer, hvorpaa de er grundede, maa ansees for at være af udelukkende specifik Natur. Det samme er Tilfældet med den af Ayres i 1855 opstillede Slægt *Leptogunellus*, for hvilken Pallas's *Blennius anguillaris* fra det Stille Hav er Typen (Proc. Acad. Calif. Nat. Sci. 1855).

Disse Underslægter ville saaledes efter Tandforholdene kunne characteriseres saaledes:

A. Subg. **Lumpenus,** Reinh. 1835—36. *Tænder i Kjæverne og paa Palatinbenene.*

1. *L. fabricii*, Reinh. 1835—36. (Grønland, Spitsbergen).
2. *L. medius*, Reinh. 1838. (Grønland, Spitsbergen).
3. *L. anguillaris*, (Pall.) 1811. (Nord-Americas Vestkyst).

B. Subg. **Leptoclinus,** Gill (1861) 1864. *Tænder i Kjæverne, paa Palatinbenene, og paa Vomer.*

1. *L. maculatus*, (Fries) 1837. (Grønland, Nord-Americas Østkyst, Spitsbergen, Nord-Europas Vestkyst).

C. Subg. **Leptoblennius,** Gill 1860. *Tænder blot i Kjæverne.*

1. *L. lampetraeformis*, (Walb.) 1792. (Grønland, Island, Spitsbergen, Nord-Europas Vestkyst).
2. *L. nubilus*, (Richards.) 1855. (Arctisk Nord-America, Spitsbergen?).
3. *L. serpentinus*, (Storer) 1848—51. (Nord-Americas Østkyst).

vomer), corrected by Reinhardt in his treatise on the fishes of Greenland (1838), as a misprint or an error in the manuscript, to "Ganebuerne" (palatine bones). In this paper the author again discusses the genus, distributing its several species among three groups or sub-genera — not however with a separate nomenclature — under the common generic name of *Clinus*, given by Cuvier. This classification, based wholly on the arrangement of the teeth, should doubtless be retained, in the event of further sub-division of the genus proving needful.

In the first group, or sub-genus, Reinhardt classes together (1838) the two species *Clinus lumpenus (Lumpenus fabricii)* and *Clinus medius*; whereas *Clinus aculeatus*, since found to be furnished with teeth on the vomer also, is assigned a place in the second group; the third sub-division comprises *Clinus gracilis*, a new species, having teeth in the jaws only, none on the vomer and the palatine bones.

The first to arrange the different species of *Lumpenus* among distinct genera was Gill, who, in his catalogue of fishes occurring on the north-western shores of North America (Proc. Acad. Nat. Sci. Philad. 1861), and subsequently in his synoptical review of the family *Stichæidæ* (ibid 1864), refers the 6 species there mentioned as inhabiting that wide region to no less than 5 different genera. Of these, however, 2 at least, viz: *Anisarchus* and *Centroblennius*, should unquestionably be excluded, the characters on which they are based being wholly specific. The same, too, is the case with the genus *Leptogunellus*, established by Ayres in 1855, typical form Pallas's *Blennius anguillaris*, inhabiting the Pacific Ocean (Proc. Acad. Calif. Nat. Sci. 1855).

These sub-genera, based accordingly on peculiarities connected with the teeth, may be characterised as follows: —

A. Subg. **Lumpenus,** Reinh. 1835—36. *Teeth in jaws and on the palatine bones.*

1. *L. fabricii*, Reinh. 1835—36 (Greenland, Spitzbergen).
2. *L. medius*, Reinh. 1838 (Greenland, Spitzbergen).
3. *L. anguillaris*, (Pall.) 1811 (Western coast of North America).

B. Subg. **Leptoclinus,** Gill (1861) 1864. *Teeth in jaws, on the palatine bones, and on the vomer.*

1. *L. maculatus*, (Fries) 1837 (Greenland, east coast of North America, Spitzbergen, west coast of Northern Europe).

C. Subg. **Leptoblennius,** Gill (1860). *Teeth in jaws only.*

1. *L. lampetræformis*, (Walb.) 1792 (Greenland, Iceland, Spitzbergen, west coast of Northern Europe).
2. *L. nubilus*, (Richards) 1855. (Arctic regions of North America, Spitzbergen?).
3. *L. serpentinus*, (Storer) 1848—51 (Eastern shores of North America).

Uagtet det maa erkjendes, at en Optræden eller Mangel af Tænder paa Craniets tandbærende Ben hos Fiskene i Regelen kunne afgive Characterer af en afgjørende Betydning ved Slægternes Adskillelse, maa dette Forhold hos *Lumpenus*-Gruppen utvivlsomt ansees for at være af mindre Vægt, idet Tandsættet ideihele baade er lidet constant, og uden samtidig at være ledsaget af tilsvarende Forskjelligheder i den øvrige Legemsbygning, der er særdeles overensstemmende hos alle Arter.

Hertil kommer, at de Tænder, der kunne optræde paa Vomer og Palatinbenene, ere uden Undtagelse yderst fine, og i mange Tilfælde er det først efter nøje Undersøgelser muligt at paavise deres Tilstedeværelse, selv hos de større Individer. At de paa disse Ben forekommende Tænder ikke kunne være af nogen særdeles Betydning for Individet, fremgaar alene af den Omstændighed, at de først udvikles længe efter Kjævetænderne (der aldrig mangle), saaledes at Characterer, hentede af dette Forhold, hos yngre Individer ganske tabe sin Anvendelse. Hos *L. medius* ere saaledes Palatintænderne endnu umærkelige hos Individer, der ere halvvoxne (eller hvor Totallængden er under 70mm); hos *L. maculatus* er netop det samme Tilfældet med Vomerin- og Palatintænderne. Det synes saaledes ikke hensigtsmæssigt at tillægge de paa disse Tandforholde byggede Characterer hos denne Slægt en videre Vægt, end i det højeste til Adskillelse af Underslægter.

L. medius tilhører saaledes Slægten *Lumpenus* i begrændset Forstand, ligesom *L. fabricii* fra Spitsbergen og Grønland, samt Pallas's *Blennius anguillaris* fra det stille Hav. Overensstemmelsen mellem disse Arter er visselig saa gjennemgaaende, at det bliver ganske unaturligt at henføre dem under forskjellige Slægter, saaledes som af Gill og Ayres er forsøgt. For *L. medius* har Gill, som ovenfor nævnt, i 1864 opstillet Slægten *Anisarchus*; men den eneste af de Characterer, der skulde kunne have Værdi som Slægtsmærke, nemlig Antallet af Gjællestraaler, hvilket opgives at være 7 hos *Lumpenus*, 6 hos *Anisarchus*, er ikke fuldkommen constant. Vistnok har Kröyer altid hos sine Exemplarer af *L. fabricii* fundet 7 Gjællestraaler; derimod opgiver baade Fabricius (for sin *Blennius lumpenus*) 6, og Malmgren har fundet samme Antal idetmindste hos 3 af sine 4 spitsbergenske Exemplarer. Hos denne Art synes saaledes Gjællestraalernes Antal at variere, og er følgelig ikke skikket til at opstilles som eneste Slægtscharacter.

Den første korte Diagnose af *L. medius* meddeler Reinhardt i 1838 i sin ovennævnte Afhandling om Grønlands Fiskefauna. I Günthers Diagnose i Cat. Fish. Brit. Mus. vol. 3 (1861), der var affattet efter et grønlandsk Individ i Leydner-Musæet, angaves Arten at mangle Palatintænder, hvilket sandsynligvis har havt sin Grund deri, at det undersøgte Individ var ungt, og endnu ikke havde faaet disse udviklede. Udførligere Beskrivelse er dog først i 1862 meddelt af Krøyer i Naturhistorisk Tidsskrift (3die Række, 1ste Bind 1861—63), og til denne Beskrivelse føjer Malmgren i sin Afhandling om Spitsbergens Fiske

It cannot indeed be denied that, as a rule, the arrangement of the teeth on the dental bones of the cranium does furnish characters of very great importance in distinguishing between allied genera of fishes; but, in the case of the *Lumpenus* group, less weight must decidedly be attached to the dental characters, which, on the whole, prove anything but constant; nor does the structure of the body in other respects exhibit any corresponding distinction, being remarkably uniform in all the species.

Besides, the teeth that can occur on the vomer and the palatine bones are without exception exceedingly small, so minute, indeed, that considerable difficulty is often experienced in detecting them, even in large-sized adults. Moreover, it is obvious that the teeth on these bones cannot be essential, or of much importance even, to the individual, seeing that they do not appear till long after those on the maxillaries (never wanting) are fully developed; and hence such distinctive dental characters do not apply to young individuals. In *L. medius*, the palatine teeth are therefore scarcely perceptible in half-grown individuals (with a total length under 70mm); in *L. maculatus*, precisely the same is the case with the vomerine and palatine teeth. Hence it is hardly advisable to attach much weight to characters based on such dental divergences, otherwise than as a means of distinguishment between sub-genera.

Accordingly *L. medius* belongs, in a limited sense, to the genus *Lumpenus*; also *L. fabricii*, occurring on the shores of Spitzbergen and Greenland, and Pallas's *Blennius anguillaris*, inhabiting the Pacific Ocean. These species exhibit *inter se* a uniformity so general and striking, that classification under separate genera, as suggested by Gill and Ayres, seems quite out of the question. For *L. medius*, Gill, in 1864, established the genus *Anisarchus*, as mentioned above; but the sole character of any real value as a generic distinction, viz. the number of branchiostegous rays — 7 in *Lumpenus*, 6 in *Anisarchus* — is not strictly constant. True, Kröyer has found 7 branchestegals in all his specimens of *L. fabricii*; but Fabricius (in his description of *Blennius lumpenus*) gives 6, and Malmgren observed the same number in at least 3 of the 4 specimens he obtained on the coast of Spitzbergen. Thus, to some extent the number of branchiostegous rays does vary in this species, and cannot therefore be appropriately regarded as the sole generic character.

The first brief diagnosis of *L. medius* was furnished by Reinhardt, 1838, in his treatise — cited above — on the Fauna of Greenland. Günther's diagnosis in Cat. Fish. Brit. Mus. vol. 3 (1861), from a Greenland specimen, preserved in the Museum at Leyden, describes the species as not having palatine teeth; probably, however, the specimen examined was a young individual, and the teeth on the palatine bones accordingly as yet obsolete. The first detailed description was given in 1862, by Kröyer (Naturh. Tidsskr. 3 Række, 1 B. 1861—63); and this description has been since supplemented by Malmgren in his treatise

i 1864 flere Tillæg. Saavidt vides, er Arten tidligere ikke bleven afbildet.

Udmaalinger. Af de under Nordhavs-Expeditionen erholdte Individer var alene et enkelt Individ sandsynligvis nærved at være fuldvoxent (122^{mm}); de øvrige vare mindre.

	Totallængde.	Hovedets Længde.
a. (Advent Bay)	62^{mm}	11.5^{mm}
b. (Advent Bay)	66 -	12.5 -
c. (*Stat.* 366)	68 -	13 -
d. (*Stat.* 366)	84 -	16 -
e. (Advent Bay)	89 -	16.5 -
f. (*Stat.* 366)	89 -	16.5 -
g. (*Stat.* 366)	122 -	22 -

Beskrivelse. *Legemsbygning.* Legemets Højde over Nakken indeholdes hos alle de erholdte Individer omtrent 11 Gange i Totallængden; bagenfor Nakken er Legemet jevnhøjt indtil Anus, eller hæver sig ganske ubetydeligt, især hos enkelte mindre Individer, indtil Begyndelsen af Dorsalen.

Anus er beliggende forholdsvis langt tilbage, saaledes, at Legemets Længde foran Anus forholder sig til Partiet bag Anus (Halen), som 1 til 1.4.

Hovedet er relativt noget mindre hos de udvoxede Individer, end hos de yngre; hos de sidste indeholdes det 5.2 til 5.4 i Totallængden, hos de ældre 5.5 til 5.9, eller endog 6 Gange i denne. Kjæverne ere omtrent lige lange fortil, og naa tilbage til Øjets forreste Rand.

Øjnene ere temmelig tætstaaende og store, saint længere end Snuden, og indeholdes 3½ til 4 Gange i Hovedlængden. Næseborene ere 1 Par, endende i korte Tuber; i Nærheden af hvert af dem findes en større Pore, der maaske kunne opfattes som et andet Par Næsebor.

Gjællespalten er vid, og naar nedtil frem under Midten af Øjet (saaledes længere frem, end hos de øvrige Lumpener). Gjællehinderne, der have hver 6 Straaler, ere nedtil sammenstødende, uden egentlig at danne nogen fri Fold paa Struben.

Tænderne, der ere tilstede i Kjæverne og paa Palatinbenene, ere samtlige smaa og svage; hos alle Nordhavs-Expeditionens yngre Individer ere Tænderne paa disse sidste Ben endnu umærkelige, og selv hos det største ere de særdeles svage, skjønt fuldt udviklede.

Finnerne. Straaleantallet viste sig idethele temmelig constant hos de erholdte Individer:

a.	D. 61;	A. 40;	P. 14—14.
b.	- 61;	- 40;	- 14—14.
c.	- 62;	- 40;	- 14—14.
d.	- 63;	- 41;	- 14—15.
e.	- 61;	- 41;	- 15—15.
f.	- 60;	- 41;	- 15—15.
g.	- 61;	- 41;	- 14—15.

on the fishes of Spitzbergen. The species is not known to have been previously figured.

Measurements. — Of the specimens obtained on the North Atlantic Expedition, one only appeared to have nearly reached the adult stage of growth (122^{mm}); all the rest were immature individuals.

	Total Length.	L. of Head.
a. (Advent Bay)	62^{mm}	11.5^{mm}
b. (Advent Bay)	66 -	12.5 -
c. (*Stat.* 366)	68 -	13 -
d. (*Stat.* 366)	84 -	16 -
e. (Advent Bay)	89 -	16.5 -
f. (*Stat.* 366)	89 -	16.5 -
g. (*Stat.* 366)	122 -	22 -

General Description. *Structure of the Body.* — Depth of body at nape, in all the specimens obtained, is to total length about as 1 to 11; posterior to the nuchal region, the depth continues uniform as far as the vent, or, in the smaller examples, slightly increases up to the commencement of the dorsal.

The vent placed comparatively far back, the length of the body anterior to the orifice being to the length of the postanal region (the tail) as 1 to 1.4.

Head somewhat smaller in adults than in young examples: in the latter, the length is to the total length as 1 to 5.2—5.4; in the former, as 1 to 5.5—5.9 (or even 6). Jaws about equal in length, reaching back to the anterior margin of the eye.

Eyes rather close and large; their longitudinal diameter, exceeding the length of snout, is to length of head as 1 to 3½—4. Nostrils — one pair only,— terminating in short tubes; in close proximity to each occurs a large pore, which, perhaps, may be regarded as forming together a second pair of nostsils.

Branchial opening wide, extending forwards under the middle of the eye (farther accordingly than in any of the other *Lumpenus* species). Branchiostegous membranes, each furnished with 6 rays, contiguous on the isthmus, without however producing a free fold on the throat.

Teeth, small and feeble, in the jaws and on the palatine bones. In all the younger examples taken on the Expedition, the palatine teeth were as yet obsolete, and in the largest even, exceedingly feeble, though fully developed.

Fins: — The number of fin-rays was comparatively constant in all the specimens obtained.

a.	D. 61;	A. 40;	P. 14—14.
b.	- 61;	- 40;	- 14—14.
c.	- 62;	- 40;	- 14—14.
d.	- 63;	- 41;	- 14—15.
e.	- 61;	- 41;	- 15—15.
f.	- 60;	- 41;	- 15—15.
g.	- 61;	- 41;	- 14—15.

Dorsalen begynder over Pectoralernes Rod; dens Straaler, der ere 61 eller 62, sjeldnere 60 eller 63 i Antal, ere i Begyndelsen korte, og 1 eller et Par af dem ere ved Roden næsten fri; den har omtrent fra Midten af en jevn Højde bagover, og den sidste Straale er ved en Membran forbunden med Caudalen.

Analen har 41—42 Straaler (sjeldnere 40 eller 43); den første, der er ganske kort, er en Pigstraale, de øvrige leddede, og i Spidsen kløvede. Den er fortil lav, men tiltager i Højde bagtil, saaledes at dens sidste Straale er $^1/_5$ længere, end den tilsvarende i Dorsalen. Denne sidste Analstraale er (ligesom Dorsalens) efter sin hele Længde ved en Membran forenet med Caudalen, og lægger sig længere ud over dennes Rod, end det er Tilfældet med den tilsvarende Straale i Dorsalen.

Caudalen er jevnt ægformigt afrundet, hos de yngre noget stumpere; som ovenfor nævnt er den ved Grunden forbundet ved en Membran med Dorsalens og Analens sidste Straale. Den bestaar af omkring 17 længere Straaler, der alle ere leddede (og, med Undtagelse af et Par paa hver af Siderne, tillige delte), foruden af et Par korte og uleddede Støttestraaler.

Pectoralerne ere jevnt afrundede, noget kortere end Hovedet, eller omtrent af Caudalens Længde, samt relativt noget længere hos de yngre, end hos de ældre Individer; de indeholdes i Totallængden omtrent 8 Gange. Straalernes Antal er typisk 14, sjeldnere 13 eller 15; alle ere leddede, og de øverste og mellemste tillige kløvede. Hos de nederste Straaler rager Spidsen et kort Stykke udenfor Membranen.

Ventralerne ere forholdsvis smaa, indeholdes hos det største af de erholdte Individer (Totall. 122^{mm}) 24 Gange i Totallængden, hos de mindre omtr. 22 Gange i denne. De bestaa af en særdeles kort Pigstraale, og 3 leddede Straaler, alle yderst spinkle.

Sidelinien. Som hos alle Arter er Sidelinien utydelig, men kan dog overalt forfølges i sin Helhed. Den udspringer ved Gjællespaltens øvre Ende, og gaar derfra ret ud mod Caudalen i den Fure, som danner Legemets Midtlinie. Porerne ere overalt ganske smaa og tætstaaende, saaledes, at der i det Hele kommer omtrent 2 Porer for hver Hvirvel.

Skjællene. Disse ere smaa og lidet fremtrædende; de ere særdeles fastsiddende, og ordnede i tætstillede Rækker. De strække sig frem paa Hovedet, hvor de bedække Kinderne, men ere her cycloide, medens de paa Legemet ere imbricate.

Farven er afvigende fra de øvrige Arters derved, at Pletterne ere faa og utydelige. Bundfarven er graagul; Krøyer og Reinhardt beskrive sine Individer som ganske ensfarvede; Malmgren paaviser derimod, at Pletter ere tilstede hos det friske Individ, men forsvinde efterhaanden mere, naar dette en Tid har været opbevaret paa Spiritus. Hos de fleste af de under Nordhavs-Expeditionen erholdte Individer ere endnu disse Pletter delvis i Behold, skjønt de ofte ere svage og næsten usynlige. Hos det største af

Dorsal commencing immediately above the origin of the pectorals; number of rays 61 or 62, more rarely 60 or 63, the first in the series short, 1, or sometimes 2, almost free at the base; from about the middle of the fin, the depth continues uniform, the terminal ray being connected with the base of the caudal by a thin membrane.

Anal furnished with 41—42 rays (more rarely 40 or 43), the first, which is spinous, being quite short; the rest articulated and branched at the points. In the anterior part depressed, this fin gradually increases in depth, its terminal ray being one-fifth longer than that corresponding with it in the dorsal. The last of the anal rays (in common with that of the dorsal) attached throughout its entire length by a connective membrane to the base of the caudal, and extending farther beyond it than does the terminal ray in the dorsal.

Caudal rounded (subtruncate), in younger individuals somewhat more obtuse; at the base connected by a membrane with the terminal rays in the dorsal and anal. This fin consists of about 17 long rays, all of them articulated, and, saving one or two on either side, bipartite also, exclusive of a couple of short rudimentary rays without articulation.

Pectorals uniform convex, in length somewhat shorter than than the head, or about equal to the caudal, and relatively a trifle longer in young than in adult individuals; their length is to total length nearly as 1 to 8. Typical number of rays 14, — 13 or 15 more rarely observed; they are all articulated, the uppermost and the medial likewise cleft. In the lowermost rays, the points slightly projecting above the membrane.

Ventrals comparatively small; length in the largest of the specimens obtained (total length 122^{mm}) is to total length as 1 to 24, in the smaller examples, about as 1 to 22. They consist of one exceedingly short spinous ray, and 3 articulated rays, all extremely slender.

Lateral Line. — As in all the other species, the lateral line is indistinct, but can be traced throughout its entire length. It commences at the upper extremity of the branchial opening, passing from thence straight to the caudal, along the furrow forming the mesial line. The pores are exceedingly minute and close, about 2 to each vertebra.

Scales. — Small, and not plainly visible, firmly attached to the skin, and closely arranged in regular series. They extend out on the head, where they cover the cheeks; here, however, they are cycloid, but imbricate on the body.

Colour. — In its marking, this species is distinguished by the spots, which are few and indistinct. Ground-colour greyish-yellow. Kröyer and Reinhardt both describe their specimens as of a uniform colour; Malmgren, however, has shown that spots undoubtedly occur in individuals newly taken, but gradually become obsolete in spirit-specimens. In most of the examples obtained on the Expedition, these spots are still obvious, though less distinct. The largest individual is marked with a number of light brown-

Individerne strække sig en Del saadanne af lys brunlig Farve langs hele Legemet, ligesom der findes flere brunsorte Længdepletter paa Midten af Dorsalen. Flere af de mindste Individer derimod ere næsten uplettede, og have en smudsig graagul Bundfarve, der næsten ligner den, som Fiske pleie at antage, naar de i nogen Tid have været udsatte for Fordøjelsen i en Fiskemave.

Appendices pyloricae befandtes hos et af de yngre Individer at være 4 i Antal, de 2 kortere end de øvrige.

Føde. I Ventrikelen af et mindre Exemplar fra Magdalenebay fandtes fintfordelte Crustaceer, der ikke lode sig bestemme. Selv tjener Arten, ifølge Malmgrens Observationer paa Spitsbergen i 1861, til Føde for flere Fugle, især *Uria grylle*.

Udbredelse. *L. medius* er hidtil blot funden ved Grønlands og Spitsbergens Kyster. I 1835 anmeldtes den af Reinhardt for Videnskabs-Selskabet i Kjøbenhavn fra Grønland; senere er den hjembragt i adskillige Individer fra Spitsbergen under de svenske Expeditioner, og den angives at forekomme talrigere her, end de øvrige Arter. Dette synes ogsaa at kunne bekræftes ved Nordhavs-Expeditionen, som erholdt den, som ovenfor nævnt, i 7 Individer fra et Par forskjellige Localiteter paa denne Øgruppe. Ved Finmarken, eller paa andre Steder af Ishavet er den hidtil ikke angivet som funden.

16. **Lumpenus maculatus**, (Fries) 1837.

Pl. II, Fig. 18.

Lumpenus aculeatus, Reinh. Overs. 1835—36, Kgl. D. Vid. Selsk. Naturv. Math. Afh. 6 Del, p. CX (Kbhvn. 1837). Uden Beskrivelse eller Diagnose.
Clinus maculatus, Fries, Kgl. Vet. Ak. Handl. 1837, p. 49 (1837).
Clinus aculeatus, Reinh. Kgl. D. Vid. Selsk. Naturv. Math. Afh. 7 D., p. 114 og 122 (1838).
Lumpenus (Ctenodon) maculatus, Nilss. Skand. Fauna, 4 Del, p. 190 (1855).
Stichaeus maculatus, Günth. Cat. Fish. Brit. Mus. vol. 3, p. 281 (1861).
Stichaeus aculeatus, Günth. Cat. Fish. Brit. Mus. vol. 3, p. 281 (1861). Straaleantallet fejlagtigt.
Leptoclinus maculatus, Gill. Proc. Acad. Nat. Sci. Philad. 1861. App. p. 45 (1861).
Lumpenus aculeatus, Kr. Naturh. Tidsskr. 3 R. 1 B., p. 268, Kbhvn. 1861—63 (1862).

Diagn. *Tænder i Kjæverne, paa Vomer og Palatinbenene. Hovedet indeholdes hos de yngre Individer 5⅓, hos de ældre indtil 6 Gange i Totallængden. Overkjæven ubetydeligt længere, end Underkjæven, naar tilbage til Øjets Midte eller dets bagre Rand. De 2—4 første Dorsalstraaler korte, og ved Roden fri. Pectoralerne forholdsvis store, indeholdes omtrent 6—7 Gange i Totallængden; de 5—6 nedre Straaler pludseligt forlængede. Caudalen ved Roden fri, bagtil ret*

ish spots, extending along the whole of the body; longitudinal patches occur, too, in the middle of the dorsal fin. Some of the youngest individuals, however, are of a uniform dirty greyish-yellow, closely resembling that which the skin of fishes assumes in the stomach of a fish some time after the process of digestion has commenced.

In one of the younger individuals, the pyloric appendages were 4 in number, 2 shorter than the others.

Food. — In the stomach of one of the small specimens, from Magdalene Bay, were found minute fragments of crustaceans, which did not admit of being determined. According to Malmgren, this species is preyed upon by several birds, more especially *Uria grylle*.

Distribution. — *L. medius* has hitherto been observed on the shores of Greenland and Spitzbergen only. In 1835, Reinhardt communicated its occurrence on the coast of Greenland to the "Vidensk.-Selskabet" in Copenhagen; since then, individuals have been repeatedly taken off Spitzbergen, on the several Swedish Expeditions to that region, where it is said to be more numerous than any of the other allied species. This statement would appear corroborated by the experience of the North Atlantic Expedition, on which seven specimens were obtained. On the coast of Finmark, or in other parts of the Polar Sea, it is not as yet known to have been observed.

16. **Lumpenus maculatus**, (Fries) 1837.

Pl. II, fig. 18.

Lumpenus aculeatus, Reinh. Overs. 1835—36, Kgl. D. Vid. Selsk. Naturv. Math. Afh. 6 D. p. CX (Kbhvn. 1837). No description or diagnosis.
Clinus maculatus, Fries, Kgl. Vet. Ak. Handl. 1837, p. 49 (1837).
Clinus aculeatus, Reinh. Kgl. D. Vid. Selsk. Naturv. Math. Afh. 7 D., p. 114 and 122 (1838).
Lumpenus (Ctenodon) maculatus, Nilss. Skand. Fauna, 4 Del. p. 190 (1855).
Stichaeus maculatus, Günth. Cat. Fish. Brit. Mus. vol 3, p. 281 (1861).
Stichaeus aculeatus, Günth. Cat. Fish. Brit. Mus. vol. 3, p. 281 (1861). Fin-ray formula inaccurate.
Leptoclinus maculatus, Gill. Proc. Acad. Sci. Philad. 1861. App. p. 45 (1861).
Lumpenus aculeatus, Kr. Naturh. Tidsskr. 3 R. 1 B., p. 268, Kbhvn. 1861—63 (1862).

Diagnosis. — *Teeth in jaws, on the vomer, and on the palatine bones. Length of head in young individuals is to total length as 1 to 5⅓; in adults as 1 to 6. Upper jaw, slightly projecting beyond lower, reaches back to the middle of the eye or its posterior margin. The 2—4 first dorsal rays short, and free at base. Pectorals comparatively large, length to total length as 1 to 6—7; the 5 or 6 lower rays suddenly elongated. Caudal free at base; posterior margin*

*afskaaret. Legemet foran Anus forholder sig til Halepartiet, som 1 : 1,3. Farven gulagtig med 5 store brunagtige Tverpletter nedad Ryggen; Mellemrummene opfyldte af mindre og svagere Pletter, der kunne være næsten manglende; Caudalen og Dorsalen med Tverbaand. Appendices pyloricae 2—3. Hannerne have stærkere Tænder, end Hunnerne. Størrelsen indtil 180*mm.

M. B. 6. D. 58—60 (61); A. 36—37 (35 eller 38); P. 15 (16); V. 4; C. 4/15/4 (14).

Localit. fra Nordh. Exped. Spitsbergen.

	Stat. 366.
Beliggenhed.	Magdalenebay, N. Spitsbergen.
Dybde.	50 Fayne (91 m).
Temp. paa Bunden.	— 1,0° C.
Bunden.	Mørkgraat Ler.
Datum.	17de August 1878.
Antal Indiv.	1 Indiv.

Bemærkninger til Synonymien. Som det under foregaaende Art er nævnt, fandt allerede Prof. Reinhardt (sen.) i 1838 det hensigtsmæssigt at henføre denne Art, der i Modsætning til de øvrige Lumpener besad Tænder (foruden i Kjæverne) tillige paa Palatinbenene og paa Vomer, under en egen Afdeling, der blot indbefattede denne Art. For denne foreslog Nilsson i 1855 i sin Skand. Fauna Navnet *Ctenodon*. Men da dette Navn allerede i 1830 var benyttet af Wagler for et Reptil (Fam. *Ameividae*), i 1838 af Ehrenberg for en Infusorie (*Rotatoria*), og i 1839 af Swainson for en Fisk, bliver Navnet *Leptoclinus*, fremsat af Gill i 1861, men først i 1864 characteriseret, at anvende for denne Underslægt.

Mellem den Reinhardtske *L. aculeatus* fra Spitsbergen, og Fries's Art *L. maculatus* fra Bohuslen, kan der ikke paavises nogensomhelst Forskjel. Jeg har nøje sammenlignet det forhaandenværende Individ fra Spitsbergen med andre fra Christianiafjorden og Bohuslen, og finder dem i alle Henseender overensstemmende. Straaleantallet er gjennemsnitligt det samme; det under Nordhavs-Expeditionen erholdte Individ havde D. 61; A. 37; P. 15—15, medens et andet Individ fra Isfjorden paa Spitsbergen, som jeg har havt til Undersøgelse fra Tromsø Museum, havde i Dorsalen 59, i Analen 35, saaledes at Tallet synes at variere. 2 Exemplarer fra Christianiafjorden havde begge i Dorsalen 58, i Analen 36 Straaler.

At Fries's Navn *maculatus* ved Spørgsmaalet om Prioriteten bliver at anvende, kan neppe ansees for tvivlsomt. Det Bind af det D. Vidensk. Selsk. Forh. (6te Del), hvori Reinhardt opstillede sin *Lumpenus aculeatus*, udkom i 1837, samme Aar, som Fries i Kgl. Vet. Akad. Handl. udførligt beskrev sin *Clinus maculatus* fra Bohuslen. Men uagtet Reinhardt allerede havde omtalt sin Art under Navn

*square. Length of body anterior to the vent is to that of the caudal region as 1 to 1.3. Colour yellowish, the back marked with 5 large brownish transverse spots; the intervals filled up with smaller and less distinct spots, in some examples almost obsolete; caudal and dorsal traversed by transverse bands. Pyloric appendages 2—3. The males have stronger teeth than the females. Length reaching 180*mm.

M. B. 6. D. 58—60 (61); A. 36—37 (35 or 38); P. 15 (16); V. 4; C. 4 15/4 (14).

Locality (North Atl. Exped.): — Spitzbergen.

	Stat. 366.
Exact Locality.	Magdalene Bay, N. Spitzbergen.
Depth.	50 Fathoms (91 m).
Temp. at Bottom.	— 1.0° C.
Bottom.	Dark-grey Clay.
Date.	17th August 1878.
Numb. of Specim.	1 Indiv.

Remarks on the Synonymy. — As previously stated, in connexion with the foregoing species, Prof. Reinhardt sen., so far back as 1838, saw fit to class *L. maculatus*, which, unlike the other species, is furnished with teeth on the vomer and the palatine bones as well as in the jaws, in a separate sub-division, comprising this one species only. In 1855, Nilsson suggested the name *Ctenodon* for the species, in his "Skandinavisk Fauna." But this designation having been adopted by Wagler, in 1830, for a reptile (fam. *Ameividæ*), by Ehrenberg, in 1838, for a species of infusoria (*Rotatoria*), and by Swainson, in 1839, for a fish, the name *Leptoclinus* — given by Gill in 1861, but not characterized till 1864 — will have to be retained for this sub-genus.

Between Reinhardt's *L. aculeatus*, from Spitzbergen, and Fries's species *L. maculatus*, from Bohuslen, in Sweden, no difference whatever can be shown to exist. I have carefully compared the individual in question from Spitzbergen with examples taken in the Christiania Fjord, and find them to be in every respect identical. The number of fin-rays was generally the same. For the individual taken on the North Atlantic Expedition, the fin-ray formula is as follows: — D. 61; A. 37; P. 15—15; another example, from the Isfjord, Spitzbergen, in the Tromsø Museum, had D. 59; A. 35: hence the number would appear to vary. Two individuals, taken in the Christiania Fjord, had each 58 in the dorsal and 36 in the anal.

The question of priority with regard to nomenclature must be decided in favour of *maculatus*, the synonym suggested by Fries. In 1837 was published the volume of D. Vid. Selsk. containing Reinhardt's establishment of the species by the name of *Lumpenus aculeatus;* and the same year, Fries furnished a full description of his *Clinus maculatus* (from Bohuslen) in Kgl. Vet. Akad. Handl. Reinhardt

i Oversigten over Selskabets Forhandlinger for 1835—36; der danner Indledningen til det ovennævnte Bind, bør dog vistnok hans Navn vige for Fries's, da han ikke ledsagede sin Art med nogensomhelst Diagnose eller Beskrivelse. Først i 1838 meddelte han en saadan i sin Afhandling om Grønlands Fauna i 7de Del af samme Tidsskrift.

Arten har tidligere været afbildet i Gaimard's Planche-værk til Corvetten „La Recherche"s Rejse (Voyage Scand. Lap. etc. 1838—39, Poiss. pl. 14), men lidet tilfredsstillende; desuden hos Wright og Ekström, Skand. Fiskar, 5 Hefte, Pl. 1 (1838), men heller ikke den sidste Figur er synderlig vellykket.

Beskrivelse. *Legemsbygning.* Mellem Han og Hun er der allerede i det ydre en tydelig Forskjel, idet Hannen har stærkere Kjæver, der strække sig længere tilbage, end Hunnernes, ligesom Tænderne ere stærkere.

Anus' Beliggenhed er omtrent, som hos *L. medius*, idet Legemets Længde foran Anus forholder sig til Partiet bag Anus, som 1 : 1,3. Ligesom Kröyer har jeg hos Hunnerne fundet en yderst liden Analpapille bagenfor Anus, hvilken mangler hos Hannerne.

Legemets Højde over Nakken indeholdes 12,5 til 13 Gange i Totallængden. Bagenfor Nakken tiltager Legemet noget i Højde; omtrent midt mellem Ventralernes Rod og Anus, hvor Legemshøjden idethele er størst, indeholdes denne 9,5 til 10 Gange i Totallængden.

Hovedet indeholdes næsten nøjagtigt 6 Gange (eller ubetydeligt derunder) i Totallængden; hos yngre er det forholdsvis større, og indeholdes hos et Individ med en Totall. af 69 mm omtr. 5,3 Gange i denne. Overkjæven er tydeligt længere, end Underkjæven, og Snuden krumbøjet; hos udvoxede Hanner, hvis Kjæveparti er langt stærkere udviklet, end hos Hunnerne, naar Mundspalten tilbage til Øjets bagre Rand, medens den hos Hunnerne og de yngre Individer neppe naar over Øjets Midte. Øjnene ere store og tætstaaende, betydeligt længere, end Snudens Længde, og indeholdes i Hovedlængden hos de yngre Individer 3, hos ældre indtil $3^3/_4$ Gange. Næseborene ere 1 Par, der bære en kort Tube; en større Slimpore (eller Næsebor) aabner sig lige i Nærheden af hvert Næsebor.

Gjællespalten er vid, og naar paa Hovedets Underside frem til under Øjets bagre Rand (eller undertiden ikke fuldt saa langt). Gjællehinderne have 6 Straaler, og ere nedtil sammenstødende, uden i Regelen at danne nogen fri Fold paa Struben. (Hos et fuldt udvoxet Han-Individ er dog en saadan ganske kort Fold tilstede, hvis Bredde imidlertid ikke synderligt overskrider 1 mm).

Tænderne ere tilstede saavel i Kjæverne, som paa Vomer og paa Palatinbenene. Kjævetænderne ere størst og stærkest, især de forreste; ældre Individer, især de gamle Hanner, have enkelte af disse forlængede, især i Overkjæven, saa at de danne et Slags *dentes canini*; af saadanne findes 1 eller 2 paa hver Side. Ogsaa hos Hunnerne og de yngre Individer ere disse Hjørnetænder tilstede;

did indeed name the species in the Summary of the Proceedings of the Society, which forms the introduction to the aforesaid volume, but without annexing any description or diagnosis whatever; and hence his synonym must give way to that of Fries. The species was not described by Reinhardt till 1838, in his paper on the Fauna of Greenland.

L. maculatus has been previously figured in the plates accompanying Gaimard's Narrative of the Expedition with the corvette "La Recherche" (Voyage Scand. Lap. &c., 1838—39, Poiss. pl. 14), but the representation is far from satisfactory; and likewise by Wright and Ekström, "Skand. Fiskar", Part 5, Pl. 1 (1838), whose drawing however, also leaves much to be desired in point of accuracy.

General Description. *Structure of the Body.* — In this species, the sexes can be distinguished by the outward form alone, the male having stouter jaws, which extend farther back than in the female; the teeth, too, are stronger.

Position of vent about the same as in *L. medius*, the length of the body anterior to the vent being to that of the postanal region as 1 to 1.3. Posterior to the vent, in female individuals, occurs an exceedingly minute anal papilla, also observed by Krøyer, which is wanting in males.

Depth of body at nape is to total length as 1 to 12.5—13. Posterior to the nape, there is a slight increase in depth; midway between the origin of the ventrals and the vent, the depth of the body, which is greatest here, is contained from 9.5 to 10 times in the total length.

Length of head to total length almost exactly as 1 to 6 (or but a fraction less). In young examples, the length of the head is relatively greater, being to total length, in one individual (total length 69 mm), as 1 to 5.3. Upper jaw perceptibly longer than lower; snout curved; in adult males, which have the whole region of the jaws much stronger than females, the cleft of the mouth extends back to the posterior margin of the eye, whereas in females and immature individuals it hardly reaches above the middle of the eye. Eyes large and close together, longitudinal diameter slightly exceeding length of snout, and proportionate to the length of the head: in young individuals, as 1 to 3, in adults, as 1 to $3^3/_4$. One pair of nostrils, furnished with a short tube; a mucous pore (possibly a nostril) occurs close to each nostril.

Branchial opening wide, extending, on the under surface of the head, a little beneath the posterior margin of the eye (sometimes not quite so far). Branchiostegous membranes, furnished with 6 rays, contiguous on the under surface, but, as a rule, not producing a free fold on the throat (in a full-grown male, however, a short fold of this kind was observed, the length scarcely exceeding 1 mm).

Teeth in jaws, on the vomer, and on the palatine bones. The maxillary teeth, more especially the foremost, larger and stronger than the others; mature individuals, in particular old males, have some of these teeth elongated; mostly in the upper jaw, resembling *dentes canini*, 1 or 2 on either side. The females, and all mature individuals, also distinguished by these canine teeth, which are,

men ere her kortere. Tænderne paa Palatinbenene og paa Vomer ere mindre, og blive først bemærkelige, naar Individerne have naaet en Totallængde af omtr. 70mm.

Totallængden af Nordhavs-Expeditionens Individ er 127mm, hvoraf Hovedets Længde udgjør 21mm. Individet var en Hun, med Bughinden udspændt af Rogn. Appendices pyloricae vare 2, temmelig tykke; Krøyer fandt 3 hos det af ham beskrevne Individ.

Finnerne. Dorsalen begynder ubetydeligt foran Pectoralernes øvre Rod, og har 58 til 60, sjeldnere 61 Straaler. De forreste 2—4 ere altid ganske korte, og fuldkommen fri ved Roden; senere tiltager deres Højde indtil henimod Finnens Midte, hvorefter den atter sænker sig noget henimod Caudalen.

Analen har 36 eller 37 Straaler, undertiden 35 eller 38; den første er en kort Pigstraale, de øvrige leddede, og i Spidsen tydeligt kløvede. Den har efter hele sit Løb en temmelig jevn Højde, uden saaledes, som Dorsalen, at aftage mod begge Ender.

Caudalen er ved en distinct Halerod adskilt fra Dorsalen og Analen, uden ved noget Spor af Membran at være forenet med disse Finner. Antallet af Straaler er 15, sjelden 14, alle leddede, og de 12 mellemste tillige kløvede; desuden findes paa hver Side et Par korte Støttestraaler. Af Form er den ret afskaaret i Randen, med ganske ubetydeligt afskaarne Hjørner.

Pectoralerne, der tælle 15, eller sjeldnere 16 Straaler, hvoraf den overste er udelt, de øvrige i Spidsen kløvede, have en ejendommelig Form, idet de 5—6 nederste Straaler pludselig rage forlængede ud af Membranen, saaledes at Finnens nedre Parti bliver kjendeligt længere, end det øvre. Disse forlængede Straaler aftage noget i Længde nedad, men selv den nederste er længere, end de længste Straaler i Finnens øvre Del. Pectoralernes største Længde er hos de yngre Individer omtrent lig Hovedlængden, og indeholdes saaledes 6 Gange i Totallængden; hos de udvoxede ere de blevne relativt noget forkortede, og ere altid kortere, end Hovedlængden; hos et gammelt Han-Individ indeholdes de saaledes 7 Gange i Totallængden.

Ventralerne ere af middels Længde, have 1 særdeles kort Pigstraale og 3 leddede Straaler, tilsammen 4, og indeholdes i Totallængden hos de yngre 12 til 14 Gange, hos de ældre indtil 17 Gange.

Sidelinien er ogsaa hos denne Art tilstede, men er efter sit hele Løb særdeles utydelig. Porerne ere overalt temmelig tætstaaende, og følge i sit Løb den Fure, som danner Legemets Midtlinie.

Skjællene ere tætsiddende og ganske smaa, og strække sig frem paa Hovedet, hvor de beklæde Nakken og Kinderne; paa det sidstnævnte Sted ere de mindre tætsiddende samt cycloide, medens de paa det egentlige Legeme ere imbricate, og dække hinandens Rande.

Farven er characteristisk ved den Række af 5 store brunsorte Tverpletter, der ere stillede med lige Mellemrum henad Rygsiden; den første af disse Pletter findes omtrent

however, shorter than in the males. The teeth on the palatine bones and on the vomer not so large as those on the maxillaries; they continue obsolete, till the individual has attained a total length of about 70mm.

Total length of the individual taken on the North Atlantic Expedition 127mm; length of head 21mm. This example was a female, having the abdominal cavity distended with roe. Appendices pyloricæ 2, rather thick; Krøyer found 3 in his specimen.

Fins. — Dorsal commencing in close proximity to the base of the pectorals; number of rays 58—60, more rarely 61. The foremost 2—4 invariably short, and quite free at base, the length of the rest increasing about to the middle of the fin, which again begins to slope a little towards the caudal.

Anal furnished with 36 or 37 rays, sometimes with 35 or 38; the first short and spinous, the rest articulated, and distinctly divided at their points. The depth of this fin about the same throughout its entire length, not diminishing towards both extremities as in the dorsal.

Caudal distinctly separated from dorsal and anal, no trace of a connective membrane. Number of rays 15, seldom 14; all articulated, and the 12 middlemost also branched; on either side, too, occur a couple of rudimentary rays. In form, this fin is square, slightly docked at the extremities.

The pectorals, furnished with 15, more rarely 16 rays, all divided at the points with the exception of the uppermost, are peculiar in form, the 5—6 lowermost becoming suddenly elongated, and projecting through the membrane, in such manner that the lower part of the fin is perceptibly longer than the upper. These elongated rays diminish somewhat in length as they descend, but even the lowest is longer than the longest in the upper portion. Greatest length of pectorals in young individuals about equal to length of head, being, accordingly, to total length as 1 to 6; in adults, these fins are relatively somewhat shorter, their length never equalling that of the head; in an old male, for instance, the proportion to total length was as 1 to 7.

The ventrals, of medium length, furnished with one exceedingly short spinous ray and 3 articulated rays; length, in young individuals, is to total length as 1 to 12—14, in adults, as 1 to 17.

Lateral Line. — Occurs, too, in this species, but exceedingly indistinct throughout its entire length. The pores closely set, extending along the furrow of the mesial line of the body.

Scales. — Close and small, extending out on the head and covering the nape and the cheeks; on the latter, they are less closely arranged, and cycloid, whereas on the body proper they are imbricate, overlapping each other.

Colour. — This species is distinguished by a row of 5 large transverse spots, laterally arranged at equal distances along the back; the first in the series occurs almost

under den 6te Dorsalstraale, den sidste en halv Hovedlængde fra Haleroden. Mellemrummene mellem dem kunne være næsten uden Pletter, saaledes som hos enkelte Hunner, eller opfyldte af mindre Pletter, der ogsaa udbrede sig nedenfor Legemets Midtlinie, uden dog nogensinde at naa en saadan Størrelse, som de 5 store Tverpletter. Nedad Dorsalen løbe hos de ældre Individer omtrent 14 skraa Tverbaand, ligesom ogsaa Caudalen altid har distincte Tverbaand.

Hos et Individ fra Christianiafjorden, som jeg havde Lejlighed til at undersøge i levende Tilstand (en gammel Han, med en Totallængde af 171 mm), fandt jeg Hovedets Farve blaalig-grøn, marmoreret med brune Pletter; et smalt gulagtigt Baand løb ned foran hvert Øje, og et lignende tvers over Snuden, hvilke tilsammen indesluttede en triangulær brunsort Plet. En sort Plet fandtes ogsaa paa Gjællelaaget. Iris var mat messingfarvet, dets øvre Rand næsten sort.

Føde. Ventrikelen indeholdt adskillige hele yngre Individer af *Themisto libellula*, samt en af de skjælbeklædte Annelider *(Lepidonote)*.

Udbredelse. Reinhardts Exemplarer af hans *L. aculeatus* vare alle fra Grønland. Fra Spitsbergen har den hidtil ikke været omtalt; men foruden Exemplaret fra Magdalenebay har jeg, som ovenfor nævnt, havt Anledning til at undersøge endnu et ved Spitsbergen erholdt Exemplar. Fremdeles optræder den langs den norske Kyst, dog som det synes, idethele ikke talrigt, lige ned til Christianiafjorden; mod Syd gaar den ned til Kysterne af Bohuslen (58°), fra hvilken Localitet Arten oprindelig af Fries blev beskreven i 1837, og hvor flere Exemplarer ogsaa i de senere Aar ere fundne. Paa Nord-Americas Østkyst gaar, den ifølge Goode & Bean (1879) ned lige til New-Englands Kyster, idet den er i flere Individer erholdt i Bugten udenfor Massachusetts (42°).

immediately beneath the 6th dorsal ray, the terminal spot being distant half the length of the head from the origin of the tail. The disjunctive spaces sometimes almost spotless, for instance in some females, or covered with smaller spots, likewise extending below the mesial line, but all of them of a size considerably less than that of the large transverse spots. The dorsal, in mature individuals, marked with about 14 oblique transverse bars; the caudal, too, is invariably traversed by distinct transverse bands.

In one individual, taken in the Christiania Fjord, which I had an opportunity of examining while still alive (an old male, total length 171 mm), the colour of the head was bluish-green, freckled with brown spots; a narrow yellowish band extended downwards in front of each eye, and another traversed the snout, enclosing together a triangular patch of brownish-black. A black spot occurs, too, on the gill-plate. Irides of the colour of tarnished brass, almost black above.

Food. — The ventricle contained several perfect examples of *Themisto libellula*, and a testaceous Annelid *(Lepidonote)*.

Distribution. — Reinhardt's specimens of *L. aculeatus* were all from the coast of Greenland. From Spitzbergen, it had not previously been mentioned. But, exclusive of the specimen from Magdalene Bay, I have had an opportunity, as before observed, of examining another individual taken on the coast of Spitzbergen. Moreover, the species occurs along the shores of Norway, but not, it would seem, as a common fish, from the extreme north to the Christiania Fjord; its range southwards extends to Bohuslen (58°), the locality in which the specimen described by Fries in 1837 was taken, and several examples have been met with there of late years. On the eastern coast of North America, according to Goode & Bean (1879), the range of the species extends as far south as the coast of New England, divers individuals having been obtained in Massachusetts Bay (42°).

17. Lumpenus lampetraeformis, (Walb.) 1792.

Blennius capite laevi, etc., Mohr, Isl. Naturh. p. 84, tab. 4 (1786).
Blennius lampetraeformis, Walb. Art. Gen. Pisc. p. 184 (1792).
Centronotus islandicus, Bloch, Schneid. Syst. Ichth. p. 167 (1801).
Blennius lumpenus, pt. Faber, Fische Isl. p. 79 (1829).
Centronotus lumpenus, Nilss. Prodr. Ichth. Scand. p. 104 (1832).
Clinus nebulosus, Fries, Kgl. Vet. Ak. Handl. 1837, p. 49 (1837).
Clinus mohrii, Kr. Naturh. Tidsskr. 1 R. 1 B. 1837, p. 32 (1837).

17. Lumpenus lampetræformis, (Walb.) 1792.

Blennius capite lævi, etc. Mohr, Isl. Naturh. p. 84, tab. 4 (1786).
Blennius lampetræformis, Walb. Art. Gen. Pisc. p. 184 (1792).
Centronotus islandicus, Bloch, Schneid. Syst. Ichth. p. 167 (1801).
Blennius lumpenus, pt. Faber, Fische Isl. p. 79 (1829).
Centronotus lumpenus, Nilss. Prodr. Ichth., Scand. p. 104 (1832).
Clinus nebulosus, Fries, Kgl. Vet. Ak. Handl. 1837, p. 49 (1837).
Clinus mohrii, Kr. Naturh. Tidsskr. 1 R. 1 B. 1837, p. 32 (1837).

Blennius gracilis, Stuwitz, Nyt Mag. f. Naturv. 1 B., p. 406 (1838).
Lumpenus (Clinus) gracilis, Reinh. Kgl. D. Vid. Selsk. Naturv. Math. Afh. 7 Del, p. 194 (1838).
Lumpenus nebulosus, Nilss. Skand. Fauna, 4 Del, p. 195 (1855).
Stichaeus islandicus, Günth. Cat. Fish. Brit. Mus., vol. 3, p. 281 (1861).
Centroblennius nebulosus, Gill, Proc. Acad. Nat. Sci. Philad. 1861, App. p. 45 (1861).
Lumpenus gracilis, Kr. Naturh. Tidsskr. 3 R. 1 B., p. 282, Kbhvn. 1861—63 (1862).
Leptoblennius gracilis, Gill, Proc. Acad. Nat. Sci. Philad. 1864, p. 210 (1864).
Lumpenus lampetræformis, Coll. Norges Fiske, Tillægsh. til Forh. Vid. Selsk. Chra. 1874, p. 72 (1874).

Diagn. *Tænder i Kjæverne; ingen paa Vomer eller Palatinbenene. Hovedet indeholdes hos de yngre 5—7, hos de ældre indtil 10 Gange i Totallængden. Overkjæven ubetydeligt længere, end Underkjæven, naar tilbage til Øjets Forrand. De 3—4 første Dorsalstraaler korte, og ved Roden næsten fri. Pectoralerne jevnt afrundede, og kortere, end Hovedet, indeholdes 8—10, hos enkelte gamle Individer indtil 13 Gange i Totallængden. Caudalen ved Roden fri, hos ældre Individer stærkt, hos yngre svagere tilspidset. Anus forholdsvis fremrykket; Legemet foran Anus forholder sig til Halepartiet som 1 : 1,7; hos ældre Individer er Forholdet som 1 : 2, og derover. Farven gulagtig med talrige større og mindre graabrune Pletter, der ofte ere delvis sammenløbende; Caudalen med Tværbaand. Appendices pyloricae 2. Størrelsen indtil 350^mm (Norge); eller 412^mm (Island; Mus. Hafn.).*

M. B. 6. D. 71—72 (68—70, eller 73—74); A. 49—52; P. 15 (14); V. 4; C. 3/15/3.

Localit. **fra Nordh.-Exped.** Lofoten i Norge; Spitsbergen.

	—	Stat. 366.
Beliggenhed.	Røst i Lofoten, Norge.	Magdalenebay, N. Spitsbergen.
Dybde.	50 Favne (91 m).	50 Favne (91 m).
Temp. paa Bunden.	+ 5,0° C.	— 1,0° C.
Bunden.	Sandbund.	Mørkegraat Ler.
Datum.	26de Juni 1877.	17de Aug. 1878.
Antal Indiv.	1 ungt Indiv.	1 ungt Indiv.

Bemærkninger til Synonymien. Ved Adskillelsen af den oprindelige Slægt *Lumpenus* angav Reinhardt i 1838 (Kgl. D. Vid. Selsk. Nat. Math. Afh. 7 Del, p. 194) som Character for den 3die Gruppe Tilstedeværelse af Tænder blot i Kjæverne, medens saavel Palatinbenene, som Vomer manglede saadanne. Som Typus og eneste Art under denne Gruppe opfører han en Form, som han netop havde modtaget i et Par Exemplarer fra Grønland, og som han foreløbig identificerede med den norske *Blennius gracilis*, Stuw. Et specielt Slægtsnavn ved Siden af de øvrige Grupper, modtog denne Art først i 1861 af Gill, der i sin Catalog over Fiskene paa Nord-Americas Nordostkyst opførte den

Blennius gracilis, Stuwitz, Nyt Mag. f. Naturv. 1 B. p. 406 (1838).
Lumpenus (Clinus) gracilis, Reinh. Kgl. D. Vid. Selsk. Naturv. Math. Afh. 7 Del, p. 194 (1838).
Lumpenus nebulosus, Nilss. Skand. Fauna, 4 Del, p. 195 (1855).
Stichaeus islandicus, Günth. Cat. Fish. Brit. Mus., vol. 3, p. 281 (1861).
Centroblennius nebulosus, Gill, Proc. Acad. Nat. Sci. Philad. 1861, App. p. 45 (1861).
Lumpenus gracilis, Kr. Naturh. Tidsskr. 3 R. 1 B. p. 282, Kbhvn. 1861—63 (1862).
Leptoblennius gracilis, Gill, Proc. Acad. Nat. Sci. Philad. 1864, p. 210 (1864).
Lumpenus lampetræformis, Coll. Norges Fiske, Tillægsh. til Forh. Vid. Selsk. Chra. 1874, p. 72 (1874).

Diagnosis. — *Teeth in jaws; none on vomer and palatine bones. Length of head to total length, in young examples, as 1 to 5—7, in adults, as 1 to 10. Upper jaw slightly longer than lower, extending back to the anterior margin of the eye. The first 3 or 4 dorsal rays short, and almost free at base. Pectorals uniform convex; length less than that of the head, being to total length as 1 to 8—10, in some old individuals as 1 to 13. Caudal free at base, and acuminate, in adults considerably, in young individuals but slightly. The vent placed comparatively far in advance, the length of the body anterior to the vent being to that of the caudal region as 1 to 1.7; in old individuals, as 1 to 2, and above. Colour, yellowish, mottled with numerous greyish-brown spots, large and small, confluent in places; caudal marked with transverse bands. Pyloric appendages 2. Length reaching 350^mm (Norway); 412^mm (Iceland: Mus. Hafn.).*

M. B. 6. D. 71—72 (68—70 or 73—74); A. 49—52; P. 15 (14); V. 4; C. 3/15/3.

Locality (North Atl. Exped.): — Lofoten, in Norway; Spitzbergen.

	—	Stat. 366.
Exact Locality.	Röst, in Lofoten, Norway.	Magdalene Bay, N. Spitzbergen.
Depth.	50 Fathoms (91 m).	50 Fathoms (91 m).
Temp. at Bottom.	+ 5.0° C.	— 1.0° C.
Bottom.	Sandy Bottom.	Dark-grey Clay.
Date.	26th June 1877.	17th Aug. 1878.
Numb. of Specim.	1 Young Indiv.	1 Young Indiv.

Remarks on the Synonymy. — Reinhardt, in his classification of the genus *Lumpenus*, in 1838 (Kgl. D. Vid. Selsk. Nat. Math. Afh. 7 Del. p. 194), gave as the salient character distinguishing the 3rd group, the occurrence of teeth in the jaws only, none on the vomer or on the palatine bones. As the typical and sole species of this group, he established a form, of which one or two examples had just been sent him from Greenland, regarding it, provisionally, as identical with the Norwegian species *Blennius gracilis*, Stuw. No special generic appellation ranking with those of the other group was conferred on this species, till Gill (1861) classed it in his Catalogue of

under den (i 1860) opstillede Slægt *Leptoblennius*,[1] hvilken han senere i 1864 characteriserede væsentlig i Overensstemmelse med Reinhardt.

Paa det sidstnævnte Sted opfører han ved Siden af *Leptoblennius* yderligere en ny Slægt, *Centroblennius*, for hvilken Richardson's *Lumpenus nubilus* (Last Arct. Voy. vol. 2, 1855) udgjorde Typen. Men Forskjellen mellem disse 2 Slægter, som væsentlig er grundet paa en ringe Ulighed i Straaleantallet, er af ganske specifik Natur, og *Leptoblennius* bør derfor neppe engang anerkjendes som Underslægt.

Ved Undersøgelsen og Beskrivelsen af Individer fra de forskjellige vidt adskilte Localiteter, som denne Art bebor, er der jevnlig bleven lagt speciel Vægt paa Characterer, der ere hentede fra Hovedets og Legemshøjdens Forhold til Totallængden, et Forhold, der hos denne Art er særdeles betydelige Forandringer underkastede under Individernes Væxt. *L. lampetraeformis*, der har været kjendt i næsten et Aarhundrede, har derfor hyppig været miskjendt, og modtaget et stort Antal forskjellige Navne, idet de for den oprindelige *L. lampetraeformis* opgivne Characterer blot passe ind paa Individerne af et bestemt Alderstrin (nemlig det noget over halvt udvoxede). Jeg har allerede ved en tidligere Lejlighed berørt dette Forhold i „Norges Fiske" (Tillægshefte til Forh. Vid. Selsk. Chra. 1874, p. 72).

I 1776 blev Arten første Gang kjendeligt beskrevet og afbildet af Mohr i hans „Islandske Naturhistorie" (p. 84) fra Island, dog uden paa dette Sted at erholde noget Artsnavn. At Mohr har havt denne Art for Øje, og ikke nogen anden af de grønlandske Former, synes bl. a. at fremgaa af hans Angivelse af Straaleantallet. Et Artsnavn (*Blennius lampetraeformis*) erholdt den først i 1792 af Walbaum i den nye Udgave af Artedi's *Genera Piscium* (tom. 3, p. 184), hvor Mohr's Beskrivelse og Tegning gjengives.

I 1801 erholdt samme Mohr's Art yderligere et nyt Navn af Schneider, i hans Udgave af Bloch's *Systema Ichthyologiae*, og under dette Navn har Dr. Günther optaget Arten i sin Cat. Fish. Brit. Mus. (*Stichaeus islandicus*).

Den islandske Form blev fremdeles i 1837 gjort til Gjenstand for Behandling, nemlig af Kröyer, der (Nat. Tidsskr. 1 R. 1 B.) beskriver et fra Island nedsendt Individ under Navnet *Blennius lampetraeformis*, men foreslaar til Slutning som en mere passende Benævnelse *Clinus mohrii* (et Navn, som dog Kröyer selv ikke senere har adopteret).

I den Beskrivelse af „*Blennius lumpenus*", Lin., som Faber giver i 1822 i sin „Naturgesch. Fische Islands" (p. 79), sammenblandes saavel i Beskrivelsen, som i Synonymien Mohr's Art med Fabricius' *Blennius lumpenus* fra Grønland (= *Lumpenus fabricii*, Reinh.); dog kan det sees, at Faber neppe kan have kjendt nogen af Arterne af Autopsi.

At Walbaum's *Bl. lampetraeformis* fra Island er identisk med Stuwitz's *Blennius gracilis* fra Norges Vestkyst

[1] Opstillet for Storer's *Blennius serpentinus*.

Fishes occurring on the north-eastern coast of North America under the genus *Leptoblennius* (established 1860[1]), which he afterwards (1864) characterized much the same as Reinhardt.

Along with *Leptoblennius*, Prof. Gill introduced into his Catalogue a new allied genus, *Centroblennius*, Richardson's *Lumpenus nubilus* (Last. Arct. Voy. vol. 2, 1855) furnishing the type. The characteristic distinction between these two genera, founded principally on a slight inequality in the number of the fin-rays, is however strictly specific; and hence *Leptoblennius* can hardly be entitled to rank even as a sub-genus.

Now, when examining and describing individuals from the numerous and widely distant localities inhabited by this species, particular importance has usually been attached to characters resting on the proportion which the head and depth of the body bear to the total length; and this proportion in the present species is found to vary very considerably with the growth of the fish. Hence *L. lampetræformis*, known to ichthyologists for the space of a century almost, has frequently been misapprehended, and has been given a large number of synonyms, the characters originally believed to belong to *L. lampetræformis* being those of individuals arrived at a particular stage of growth (a little more than half-grown). On a former occasion I called attention to this fact, viz. in "Norges Fiske" (Tillægshefte til Forh. Vid. Selsk. Chra. 1874, p. 72).

In 1776, the species was first described and figured with comparative accuracy, by Mohr, in "Islandske Naturhistorie" (p. 84), but without his assigning a specific name. That it was this species Mohr had before him, and not one of the other Greenland forms, seems evident from the fin-formula given. A specific name (*Blennius lampetræformis*) was first suggested, in 1792, by Walbaum, in his edition of Artedi's *Genera Piscium* (tom. 3, p. 184), accompanied by Mohr's diagnosis and representation.

In 1801, Mohr's species had a new synonym given it, by Schneider, in his edition of Bloch's *Systema Ichthyologiæ*; and this name Dr. Günther has adopted in his Catalogue Fish. Brit. Mus. (*Stichæus islandicus*).

This Icelandic form was made the subject of further treatment by Kröyer, who (Nat. Tidsskr. 1 R. 1 B.) describes an example sent from Iceland by the name of *Blennius lampetræformis*, proposing, however, at the close of his paper, as a more appropriate designation, *Clinus mohrii*; but the latter synonym was not afterwards adopted by Kröyer himself.

In the description of *Blennius lumpenus*, Lin., given by Faber (1822) in his "Naturgesch. Fische Islands" (p. 79), Mohr's species and Fabricius's *Blennius lumpenus* from Greenland (i. e. *Lumpenus fabricii*, Reinh.) are confounded throughout, both as regards the description and the synonymy; it is evident, however, that Faber can have known nothing of either species from autopsy.

That Walbaum's *Bl. lampetræformis*, from Iceland, is identical with Stuwitz's *Bl. gracilis*, from the west coast of

[1] For Storer's *Blennius serpentinus*.

(1837), og at begge udgjøre de næsten udvoxede Individer af Fries' *Clinus nebulosus* fra Bohuslen (1837), har jeg i den ovennævnte Afhandling (Norges Fiske) tidligere søgt at begrunde; og det kan neppe være nogen Tvivl underkastet (hvad allerede Nilsson i 1855 har antydet), at den ligeledes er identisk med Reinhardts ovenfor nævnte *Lumpenus (Clinus) gracilis* fra Grønland, der omtaltes første Gang i 1838. Vistnok berøres denne af Reinhardt blot med nogle faa Ord; men Kröyer har senere (i 1862) givet en detailleret Beskrivelse af denne Form, der sees at have været et stort Individ med en Totallængde af omtr. 340 mm, og dette er i alle væsentlige Henseender overensstemmende med ligestore Individer fra de norske Kyster, saavel i den ydre, som den indre Bygning.

Foruden de Beskrivelser, der ere fremkomne gjennem Kröyer, Nilsson og Fries, haves allerede fra 1838 en særdeles udførlig saadan, forfattet af Stuwitz i Nyt Mag. f. Naturv., 1 B., hvori et næsten udvoxet Individ med en Totall. af omtr. 265 mm, fundet tilligemed et Par andre lignende i Christianiafjorden i 1835 og 1836 af Prof. Esmark, beskrives med den yderste Nøjagtighed. Der er saaledes ingen Mangel paa Beskrivelser af denne Art, men da de alle ere indbyrdes mere eller mindre uoverensstemmende, alt efter Størrelsen og de ydre Variationer hos de foreliggende Individer, har jeg troet det ikke overflødigt her at lade følge en ny og mere kortfattet, hvor der saavidt muligt er taget Hensyn til alle disse individuelle Uoverensstemmelser.

Exemplaret fra Magdalenebay havde en Totallængde af 62 mm, hvoraf Hovedets Længde udgjorde 10,5 mm. Det var saaledes (ligesom Exemplaret fra Røst i Lofoten) blot en Unge, og svarede fuldkommen til Unger af samme Størrelse fra de norske Kyster.

Beskrivelse. *Legemsbygning.* Sammenlignet med de øvrige Arter er Legemet forholdsvis langstrakt, især hos de ældre Individer. Ligeledes er Hovedet betydeligt mindre hos de ældre, end hos de yngre Individer, og hos ingen anden Art er den gradvise Forandring i denne Henseende saa betydelig.

Højden over Nakken indeholdes hos de yngre Individer (omkr. 60—70 mm) omtr. 12 Gange i Totallængden, hos de ældre lige til 20 Gange og derover; bagenfor Nakken bliver Legemets Højde ubetydeligt større, men indeholdes dog endnu hos et større Individ (Totall. 265 mm) 20 Gange i Totallængden.

Hovedet er forholdsvis lidet; dets Forhold til Totall. varierer fra $5^1/_2$ lige til 10 og derover. Saaledes indeholdes Hovedlængden i Totallængden hos de forskjellige Individer efter følgende Forholde:

Totallængde		Hovedets Forhold til Totall.
	50 mm;	5,5
—	96 -	6,0
—	130 -	7,0
—	192 -	8,3
—	265 -	9,8
—	320 -	10,3

Norway (1837), and that both represent the nearly full-grown examples of Fries's *Clinus nebulosus*, from Bohuslen (1837), I have sought to show in the treatise cited above ("Norges Fiske"); nor does there (as suggested by Nilsson in 1855) exist any valid reason for questioning its identity with Reinhardt's *Lumpenus (Clinus) gracilis*, from Greenland, mentioned for the first time in 1838. True, Reinhardt alludes to the species in a few words only; but a detailed description was furnished by Kröyer (in 1862) of this form; and the diagnosis of the specimen examined, a large individual, total length about 340 mm, corresponds in all essential particulars precisely with that of individuals of equal size from the coast of Norway, both as regards its outer and inner structure.

Exclusive of the diagnoses by Kröyer, Nilsson, and Fries, an elaborate description was furnished by Stuwitz, as far back as 1838, and published in "Nyt Mag. f. Naturv.", 1 B., in which an individual, almost mature (total length about 265 mm), found, together with one or two other examples of the same species, in the Christiania Fjord, in 1835 and 1836, by Prof. Esmark, is described with the greatest accuracy. There is accordingly no want of descriptions of this species; but all of them being, when compared together, more or less divergent, from the difference in size and external features generally characterising the specimens examined, I have not deemed it superfluous to annex a new and more compendious description, in which, so far as possible, regard has been had to these individual incongruities.

The example from Magdalene Bay had a total length of 62 mm, the length of the head being 10.5 mm. This specimen (like the example taken off Røst, in Lofoten) was accordingly a young individual, corresponding exactly with young individuals of equal size from the coast of Norway.

General Description. *Structure of the Body.* — Compared with the other species, body rather elongated, more especially in mature examples. The head, too, considerably smaller in adults than in young individuals; and in none of the other species are the gradations during growth so considerable.

Depth of body at nape, in young individuals (60—70 mm), bears to total length the proportion of 1 to 12; in mature examples, of 1 to 20, and above; posterior to the nape, the depth of the body exhibits a slight increase, being nevertheless to total length, in a comparatively large-sized individual (total length 265 mm), as 1 to 20.

Head comparatively small, its proportion to total length varying from that of 1 to $5^1/_2$ to 1 to 10, and above. The length of the head, accordingly, in the several specimens, was to the total length as follows: —

Total length		length of head to total length
	50 mm;	5.5
—	96 -	6.0
—	130 -	7.0
—	192 -	8.3
—	265 -	9.8
—	320 -	10.3

Overkjæven er tydeligt længere, end Underkjæven, og Snuden krumbøjet; Mundspalten naar tilbage til Øjets Forrand.

Øjnene ere middels store og tætstaaende, samt indeholdes omtrent 4 Gange i Hovedlængden; hos ældre Individer blive Øjnene relativt mindre, og Forholdet er her omtrent som 1 : 5.

Næseborene ere 1 Par, der bære korte Tuber; ligesom hos de øvrige Arter aabner sig foran og bag hvert af dem en større Pore.

Gjællespalterne ere vide, og naa paa Hovedets Underside frem til under Øjets bagre Rand. Gjællehinderne have 6 Straaler, der ikke ere bedækkede af Gjællelaaget (saaledes, som det er Regelen hos *L. maculatus*), og som derfor altid let kunne tælles.

Tænderne ere tilstede blot i Kjæverne, og ere i enhver Alder temmelig spinkle, hvilket staar i Overensstemmelse med de idethele spinkeltbyggede og korte Kjæver. I Overkjæven danne de flere tætte Rækker, i Underkjæven blot en enkelt, der fortil bliver dobbelt.

Anus er, sammenlignet med hvad det er Tilfældet hos de foregaaende Arter, *L. medius* og *L. maculatus*, beliggende langt fortil, saaledes at Halepartiet bliver relativt længere, end hos de 2 nævnte Arter. Især er dette Tilfældet hos de ældre Individer, hvor Halen bliver over dobbelt saa lang, som Partiet foran Anus. Medens saaledes hos disse sidste Legemets Længde foran Anus forholder sig til Længden bag samme (Halen), som 1 : 2,1, er samme Forhold hos de yngre omtrent som 1 : 1,7.

Finnerne. Dorsalen begynder ret over Pectoralernes øvre Rod, og har de første Par Straaler kortere, end de øvrige, og ved Roden næsten fri, dog aldrig saa distinct, som hos *L. maculatus*. Antallet af Straaler er nogen Variation underkastet, men er dog idethele højere, end hos nogen af de øvrige arctiske Arter[1] af denne Slægt. Det højeste Antal i Dorsalen synes at være 74, hvilket Kröyer har fundet hos et grønlandsk Individ, ligesom jeg har fundet det samme hos et Individ fra Norge. 73 har Stuwitz (i 1837) fundet hos 2 Individer, ligeledes fra Norge; de fleste norske Individer synes at have 71 eller 72 Straaler i Dorsalen, de samme Tal, som Malmgren fandt hos et Par Individer fra Spitsbergen, ligesom Nordhavs-Expeditionens Individ fra samme Localitet havde 71. Mohr opgiver ligeledes 72 for sit Typ-Exemplar fra Island, og samme Tal fandt Malm hos et Individ fra Bohuslen i Sverige. Det laveste observerede Antal synes at have været 68 (hos 5 norske Individer). Sin største Højde har Finnen noget foran Midten, uden dog at aftage i nogen særdeles betydelig Grad bagtil.

Analen har, som de øvrige Arter, 1 kort Pigstraale, og Resten leddede, og i Spidsen kløvede Straaler. Denne Kløvning tiltager med Alderen, saaledes at den hos ældre

[1] *L. serpentinus*, (Storer) fra Nordamericas Østkyst har: D. 76, A. 55 (Gill 1864, efter 1 undersøgt Expl.).

Upper jaw perceptibly longer than lower; snout aquiline; cleft of mouth reaching back to anterior margin of the eye.

Eyes of moderate size, and closely set; longitudinal diameter is to total length about as 1 to 4; in mature specimens, the eyes relatively smaller, the proportion being nearly as 1 to 5.

One pair of nostrils, furnished with short tubes; a large pore occurs, as in the other species, anterior and posterior to each nostril.

Branchial opening wide, reaching forward on under surface of head to the posterior margin of the eye. Branchiostegous membranes furnished with 6 rays, not covered by the gill-plate (as is generally the case with *L. maculatus*), and hence easy to number.

Teeth in jaws only, and at every stage of growth rather slender, a feature corresponding with the character of the jaws, which are feeble and short. In the upper jaw, they constitute several closely arranged series; in the lower, a single row only, the fore part of which is double.

Vent placed far in advance, as compared with its position in *L. medius* and *L. maculatus*, the caudal region being relatively of greater length than in either of the two latter species. This is more particularly the case with adults, which have the tail twice as long as the region anterior to the vent. Hence the length of the body anterior to the vent in mature individuals, is to the postanal region (the tail) as 1 to 2.1, whereas the proportion in comparatively young examples is as 1 to 1.7.

Fins. — Dorsal commencing immediately above the upper root of the pectorals, the two first rays shorter than the rest, and almost free at base, but never so distinct as in *L. maculatus*. The number of rays is found to vary somewhat, as a rule however exceeding that in any of the other Arctic species[1] of this genus. The greatest number of dorsal rays would appear to be 74, observed by Kröyer in a Greenland specimen; and I have myself met with the same number, in an individual taken on the coast of Norway. Stuwitz found (1837) 72 rays in two specimens obtained off the Norwegian coast; the majority of Norwegian individuals would appear to have 71 or 72 rays, the number found by Malmgren in two specimen from Spitzbergen; the individual taken on the North Atlantic Expedition in the same locality had also 71 rays. Mohr, too, gives 72 for his typical specimen from Iceland, and Malm observed 72 in an example taken on the coast of Sweden, off Bohuslen. The smallest number appears to be 68 (in 5 Norwegian individuals). The greatest depth of the fin occurs a little anterior to the medial point, diminishing but very slightly throughout the posterior half.

Anal, as in the other species, furnished with one short spinous ray; the other rays are all articulated and cleft at the points. This division, increasing with the growth

[1] *L. serpentinus*, (Storer), occurring on the eastern shores of North America, has: D. 76; A. 55 (Gill 1864; one specimen only examined).

Individer er tildels dobbelt. Straalernes Antal ligger mellem 49 og 52; naar Mohr for sit Typ-Exemplar opgiver 54, tør dette ansees som en individuel Afvigelse, hvis det ikke beror paa en fejlagtig Undersøgelse.

Caudalen udmærker sig fremfor de øvrige Arters ved sin tilspidsede Form, der især hos de ældre Individer er stærkt udpræget. Den er fuldkommen adskilt fra Dorsalens og Analens sidste Straaler, endskjønt disse lægge sig ud over Haleroden. Hos yngre Individer er Finnen noget mindre tilspidset. Straalernes Antal er omtr. 15, hvortil kommer et Antal korte og uleddede Støttestraaler paa hver Side; de 11—12 mellemste er tydeligt articulerede, samt kløvede.

Pectoralerne tælle 15, sjeldnere 14 Straaler, ere jevnt afrundede, forholdsvis korte, samt indeholdes hos de yngre Individer 8—10, hos ældre lige til 13 Gange og derover i Totallængden. Med Undtagelse af den øverste ere de alle kløvede.

Ventralerne ere af middels Længde, have 1 særdeles kort, uleddet Straale, og 3 længere leddede, tilsammen 4 Straaler. Hos yngre Individer indeholdes den endnu 17 Gange i Totallængden, men hos ældre lige til 29 Gange (og derover).

Sidelinien er særdeles utydelig, udspringer over Gjællespalten, og følger efter sit hele Løb Legemets Midtfure. Porerne ere yderst smaa og tætsiddende.

Farven er blegt gulbrun med et stort Antal dels større, dels mindre graabrune Pletter nedad Legemets Sider; alene Bugen er uden Pletter, og noget mere sølvfarvet. Størrelsen og Antallet af disse Pletter varierer betydeligt; hos de fleste, middelsstore Exemplarer sees omtrent 8 større saadanne at strække sig henad Siderne under Midtlinien, og undertiden tillige en lignende Række over denne, hvis Pletter, der tildels gaa ud over Grunden af Dorsalerne, alternere med den nedre Rækkes. Mellem disse staa altid mindre Pletter og Skygninger, der ofte ere stærkt sammenløbende.

Dorsalen har skraatløbende Tverbaand, Caudalen ligeledes 3—4 (hos ældre Individer flere) Tverbaand, medens de øvrige Finner synes uden Tegninger. Hovedet er mere marmoreret, og har en messingfarvet Iris, hvis øvre Rand er sort.

Udbredelse. *L. lampetraeformis* er for Tiden kjendt fra Grønland, Island, Spitsbergen, samt fra Europas Nordvestkyst ned til Kattegat. Medens der endnu foreligge blot faa Individer fra Grønland og Island, er den flere Gange erholdt ved Spitsbergen allerede under de svenske Expeditioner, og den gaar her op til idetmindste 80° N. B. Derimod synes den ikke at være sjelden paa de fleste Punkter langs den norske Kyst fra Finmarken af og ned til Christianiafjorden, og jeg har optaget indtil et Dusin Individer i et enkelt Kast med Torskegarn i Porsangerfjorden i Vest-Finmarken. Dens Sydgrændse synes at være Bohuslen, hvor et Par Individer ere erholdte saa langt

of the fish, sometimes becomes double in mature individuals. Number of rays varying between 49 and 52; it is true, Mohr gives 54 for his typical specimen, but this, if correctly observed, must be a mere individual deviation.

Caudal, more especially in adults, characterised by its acuminate form; it is separated from the terminal rays in the dorsal and anal, which extend notwithstanding beyond the base of the tail. Individuals comparatively young have this fin somewhat less acuminate. Number of rays about 15, exclusive of numerous short auxiliary rays on either side, without articulation; 11 or 12 of the middle ones distinctly articulated, and branched.

Pectorals furnished with 15, more rarely with 14 rays; uniform convex, comparatively short, their length, in young individuals, being as 1 to 8—10, in mature individuals as 1 to 13, and above. Pectoral rays all branched, with the exception of the uppermost.

Ventrals of moderate length; have 1 short ray, not articulated, and 3 longer articulated rays, or, altogether, 4. Length of fin, in young individuals, is to total length as 1 to 17, but in adults the proportion becomes as 1 to 29 (and even above).

Lateral Line. — Very indistinct; commences immediately above the branchial opening, passing from thence straight down the medial furrow of the body. The pores closely set, and extremely minute.

Colour. — Colour pale yellowish-brown, relieved with a number of greyish-brown spots, extending laterally along the body; the abdomen alone spotless, and of a somewhat more silvery appearance. These spots vary considerably in magnitude and number; most middle-sized examples are marked with a row of eight, stretching along the sides below the mesial line, and occasionally, too, with a similar series above, the spots composing it, which sometimes extend beyond the base of the dorsals, alternating with those in the lower row. The interspace always exhibiting spots and cloudings, the former frequently confluent.

Dorsal marked with oblique transverse bands; the caudal likewise has 3 or 4 transverse bands, (in adults a greater number), whereas the other fins would appear to be without markings of any kind. Head to a greater extent mottled; irides of a brassy yellow, black above.

Distribution. — Up to the present time, *L. lampetræformis* is known to occur on the coast of Greenland, Iceland, Spitzbergen, and the shores of north-western Europe, as far south as the Cattegat. But few examples of the species have been hitherto obtained from Greenland and Iceland; off Spitzbergen, however, it has been repeatedly observed, individuals having been taken on each of the Swedish Expeditions to the Polar Sea, and its range extends at least as far north as 80°. Along the coast of Norway, from Finmark to the Christiania Fjord, it would appear to be rather a common fish in most localities; I once took as a many as a dozen individuals at a single

ned, som ved Gøtheborg under 58° N. B. (Malm, Gøtheb. Boh. Fauna, p. 470).

Idethele er det ikke uden Interesse, at Arten forekommer fuldkommen uforandret under den forholdsvis høje Temperatur, som Havvandet har ved Norges og Sveriges Sydkyst, og i den iskolde Area ved Nordspidsen af Spitsbergen.

Fam. Lycodidae.

Gen. Lycodes, Reinh.

Overs. 1830—31, Kgl. D. Vid. Selsk. Naturv. Math. Afh. 5te Del. p. LXXIV, Kbhvn. 1832 (1830—31).

Legemet langstrakt, i Regelen skjælbeklædt: Skjællene smaa, runde, nedtrykte i Huden. Sidelinie tilstede, ofte mindre tydelig, undertiden dobbelt. Øjet af middels Størrelse. Kjæberne uden Skjægtraade: Overkjæven længere, end Underkjæven. Finnestraalerne bløde, articulerede: Caudalen utydelig, og er uden Overgang forenet med Dorsalen og Analen. Ventraler tilstede, anbragte paa Struben, bestaaende af faa, særdeles spinkle Straaler: deres Længde mindre, end Øjets Længdediameter, eller mindre, end 1/4 af Pectoralernes Længde. Gjællespalten temmelig trang: Gjællehinderne ikke indbyrdes sammenvoxede paa Hovedets Underside. Tænder i Kjæverne, samt i Regelen tillige paa Vomer og Palatinbenene. Pseudobranchier tilstede: Analpapille og Svømmeblære mangler. Appendices pyloricae 2 eller ingen.

Af denne i flere Henseender mærkelige Slægt have de seneste Aars Undersøgelser efterhaanden bragt for Dagen et ikke ringe Antal nye Former, saaledes at den er kommen til at udgjøre den artrigeste Slægt af alle hidtil bekjendte arctiske Dybvandsfiske[1].

[1] **Lycodes-Slægtens Litteratur.** Om Slægten *Lycodes* foreligger for Tiden følgende Litteratur.

1824. Sabine. (Account of the) "Fish", Suppl. to Append. Capt. Parry's Voy. for the Disc. of a NW. Passage, 1819—20, p. CCXII—III. Lond. 1824.

haul with a net, in the Porsanger Fjord, West Finmark. The southern limit of its range is probably Bohuslen, in Sweden, one or two individuals having been obtained off Gothenburg (58° N.).

It is an interesting fact, that individuals taken on the southern coast of Norway and Sweden, where the temperature of the water is comparatively high, differ in no respect from those met with in the frigid expanse of ocean at the northern extremity of Spitzbergen.

Fam. Lycodidæ.

Gen. Lycodes, Reinh.

Overs. 1830—31, Kgl. D. Vid. Selsk. Naturv. Math. Afh. 5 Del. p. LXXIV, Kbhvn. 1832 (1830—31).

Body elongated, as a rule sealed. Scales small, circular, imbedded in the skin: lateral line present, frequently indistinct, sometimes double. Eyes moderate, jaws without fringes; upper jaw longer than lower. Fin-rays soft, articulated; caudal indistinct, continuous with the dorsal and anal. Ventrals present, placed on the throat, each furnished with a few exceedingly slender rays, of a length less than the longitudinal diameter of the eye, or less than 1/4 of the length of the pectorals. Gill-opening rather narrow; branchial membrane disconnected on the inferior surface of head. Teeth in the jaws, and, as a rule, also on the vomer and palatine bones. Pseudobranchiæ present: anal papilla and swimming-bladder wanting. Pyloric appendages 2, or altogether wanting.

Within the last few years the labours of ichthyologists have brought to light a considerable number of new forms belonging to this, in many respects, remarkable genus, which is now shown to comprise a greater number of species than any of the other Arctic deep-sea fishes yet known[1].

[1] **Bibliography of the genus Lycodes.** The genus *Lycodes* is treated of in the following works: —

1824. Sabine. (Account of the) "Fish," Suppl. to Append. Capt. Parry's Voy. for the Disc. of a NW. Passage, 1819—20, p. CCXII—III. Lond. 1824.

Udredelsen af disse nyere Arter, og deres rette Forhold til de allerede bekjendte ældre Typer, frembyder imid-

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Under Navn af *Blennius polaris* beskrives en Fisk, der i Aaret 1819 fandtes opkastet paa Strandbredden i Arctisk America (North Georgia), og som synes at have været en Art af den senere opstillede Slægt *Lycodes*, ejendommelig ved sit nøgne Legeme, skjønt Totallængden var 7 eng. Tommer (omtr. 180mm), og med de for adskillige af denne Slægts Arter characteristiske Tverbaand over Legemet. Beskrivelsen er iøvrigt saa ufuldstændig, at Arten maa siges at være ganske ubestemmelig, og den er aldrig senere med Sikkerhed gjenfunden. (1 a. *L. polaris*, [Sab.]).

1828. Ross, J. C. "Appendix Nat. Hist.", Parry, Narrat. Att. to reach the North Pole 1827, p. 200. Lond. 1828.

Et Individ, der af Ross henførtes under Sabine's ovenfor nævnte Art, *Blennius polaris*, optoges under Parry's Nordpol-Expedition i Juni 1827 paa 80 Favnes Dyb nordenfor Spitsbergen, under 81° 6′ N. B. Denne er utvivlsomt en *Lycodes*, men synes at afvige fra Sabine's Art ved Finnernes Straaleantal samt Farven, og ansees af Malmgren for at være synonym med hans i 1865 fra Spitsbergen beskrevne *L. rossi*. (1 b. *L. polaris*, [J. C. Ross.]).

1830—31. Reinhardt, sen. Overs. 1830—31, Kgl. D. Vid. Selsk. Nat. Math. Afh. 5 Del, p. LXXIV. Kbhvn. 1832.

Slægten *Lycodes* opstilles, og dens Characteristik meddeles temmeligt udførligt; som dens Typus opstilles *L. vahlii*, efter et enkelt, omtrent 360mm langt Individ fra Grønland, udtaget af Ventrikelen af en *Somniosus microcephalus*. Uddrag af denne Meddelelse findes i Okens „Isis" for 1848, p. 124—125. (2. *L. vahlii*, Reinh.).

1834—35. Reinhardt, sen. Overs. 1834—35, Kgl. D. Vid. Selsk. Nat. Math. Afh. 6 Del, p. LXXV. Kbhvn. 1837.

Forfatteren giver en udførlig Diagnose af Slægten, saavelsom af Arterne *L. vahlii*, samt af den ny tilkomne *L. reticulatus*, den sidste opstillet efter 2 større Individer fra Grønland, erholdte i Aarene 1833 og 34, og ligeledes udtagne af Ventrikelen af *S. microcephalus*. Uddrag af denne Meddelelse findes i Okens „Isis" for 1848, p. 134—135. (3. *L. reticulatus*, Reinh.).

1835. Ross, J. C. "Account Nat. Hist. Fish", Sir J. Ross, App. Narr. Sec. Voy. in Search North-West Passage 1829—33, p. LII. Lond. 1835.

Et Individ, der antoges at have været Sabine's *Blennius polaris*, udtoges af Ventrikelen af en *Gadus* ved Boothia, Arctisk America. Det var stærkt mutileret, og Bestemmelsen usikker.

1838. Reinhardt, sen. „Ichthyologiske Bidrag til den grønlandske Fauna" (Kgl. D. Vid. Selsk. Nat. Math. Afh. 7 Del, p. 123—124, 147—174, og 223—228. Kbhvn. 1838).

En udførlig Beskrivelse meddeles af *L. vahlii* (hertil Pl. 5), og *L. reticulatus* (hertil Pl. 6), samt af den ny tilkomne Art *L. seminudus*, hvoraf i 1837 var erholdt et Individ med en Totallængde af omtrent 480mm ved Grønland. Et udførligt Uddrag af denne Afhandling findes i Okens „Isis" for 1848, p. 279—290. (4. *L. seminudus*, Reinh.).

1844. Krøyer. „Notice angaaende Forøgelse af den grønlandske Fiskefortegnelse" (Overs. Kgl. D. V. Selsk. Forh. 1844, p. 140. Kbhvn. 1845).

En kort og foreløbig Diagnose meddeles af 2 nye Arter, *L. perspicillum* og *L. nebulosus*, begge opstillede efter et Par Individer fra Grønland. Typ-Exemplaret af den sidste af disse Arter er tilsyneladende gaaet tabt, og den lader sig paa Grund af den ufuldstændige Beskrivelse neppe nogensinde identificere; den førstnævnte er, efter hvad der nedenfor skal søges paavist, maaske Ungen af *L. reticulatus*. (5. *L. perspicillum*, Kr. 6. *L. nebulosus*, Kr.).

184? Krøyer. Voy. Comm. Sci. Scand. Lap., Spitsb., Feroë, 1838—40, Corv. "la Recherche". Zool. Pisc. pl. 7. Paris 184?

The working out of these new species and of their true relation to the types already established is, however,

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The name of *Blennius polaris* was given to a fish found stranded in the year 1819 on the coast of Arctic America (North Georgia), and which would seem to have been a species of the subsequently established genus *Lycodes*, a salient feature being the naked body, although the total length of the specimen reached 7 English in (about 180mm); it was marked, too, with the transverse bands across the body distinguishing several species of that genus. The description, however, is far too incomplete to admit of characterising the species, and it is not known to have been subsequently met with. (1 a. *L. polaris*, [Sab.]).

1828. Ross, J. C. "Appendix Nat. Hist.," Parry, Narrat. Att. to reach the North Pole 1827, p. 200. Lond. 1828.

An individual, referred by Ross to Sabine's *Blennius polaris*, was taken on Parry's North Pole Expedition, in June 1827, at a depth of 80 fathoms, north of Spitzbergen, lat. 81° 6′ N. This specimen is unquestionably a *Lycodes*, but would seem to differ from Sabine's species in the number of fin-rays and in the colour; Malmgren regards it as identical with his *L. rossi*, also from Spitzbergen, described 1864. (1 b. *L. polaris*, [J. C. Ross]).

1830—31. Reinhardt sen. Overs. 1830—31, Kgl. D. Vid. Selsk. Nat. Math. Afh. 5 Del, p. LXXIV. Kbhvn. 1832.

The genus *Lycodes* is introduced, and its characters enumerated somewhat at length; as the type, Reinhardt gives *L. vahlii*, determined from a single specimen from Greenland, total length about 360mm, taken from the ventricle of a *Somniosus microcephalus*. Extracts from this paper will be found in Oken's "Isis", for 1848, p. 124—125. (2. *L. vahlii*, Reinh.).

1834—35. Reinhardt sen. Overs. 1834—35, Kgl. D. Vid. Selsk. Nat. Math. Afh. 6 Del. p. LXXV. Kbhvn. 1837.

The author furnishes a detailed diagnosis of the genus, and of the species *L. vahlii* and *L. reticulatus*, the latter established from 2 large individuals obtained on the coast of Greenland, in the years 1833 and 1834; these specimens, too, were taken from the ventricle of a *S. microcephalus*. Extracts from this paper will be found in Oken's "Isis" for 1848; p. 134—135. (3. *L. reticulatus*, Reinh.).

1835. Ross, J. C. "Account Nat. Hist. Fish.," Sir J. Ross, App. Narr. Sec. Voy. in Search North-West Passage 1829—33, p. LII. Lond. 1835.

An individual, believed to have been Sabine's *Blennius polaris*, was taken from the ventricle of a *Gadus*, at Boothia, Arctic America. Being greatly mutilated its determination is doubtful.

1838. Reinhardt sen. "Ichthyologiske Bidrag til den grønlandske Fauna" (Kgl. D. Vid. Selsk. Nat. Math. Afh. 7 Del, p. 123—124, 147—174, and 223—228. Kbhvn. 1838).

A full description is furnished of *L. vahlii* (Pl. 5) and of *L. reticulatus* (Pl. 6); also of a newly established species *L. seminudus*, of which a specimen — total length about 480mm — had been obtained, in 1837, on the coast of Greenland. Extracts from this treatise will be found in Oken's "Isis" 1848, p. 279—290. (4. *L. seminudus*, Reinh.).

1844. Krøyer. "Notice angaaende Forøgelse af den grønlandske Fiskefortegnelse" (Overs. Kgl. D. V. Selsk. Forh. 1844, p. 140. Kbhvn. 1845).

A brief and preliminary diagnosis is furnished of 2 new species, *L. perspicillum* and *L. nebulosus*, both established from 2 examples taken on the coast of Greenland. The typical specimen of the latter species would appear to have been lost, and on account of the incomplete description will hardly admit of being identified; the former — from reasons to be subsequently advanced — is perhaps a young example of *L. reticulatus*. (5. *L. perspicillum*, Kr. 6. *L. nebulosus*, Kr.).

184? Kröyer. Voy. Comm. Sci. Scand. Lap. Spitzb. Feroë, 1838—40. Corv. la "Recherche." Zool. Pisc. pl. 7. Paris 184?

lertid særegne Vanskeligheder, ikke blot paa Grund af den mindre gode Tilstand, hvori disse ældre Typ-Individer be-

I Gaimards Plancheverk, tilhørende Beretningen om Corvetten „La Recherche's“ arctiske Reise, giver Krøyer Afbildninger af de 2 hidtil erholdte Individer af *L. perspicillum*. Text blev ikke leveret til denne, eller til de øvrige ichthyologiske Plancher.

1855. Richardson. “Account of the Fish”, Last Arct. Voy. Command: of Sir Edw. Belcher, 1852—54, vol. 2, p. 362, Pl. XXVI. Lond. 1855.

En ny Art, *L. mucosus*, fra Arctisk America (Northumberland Sound) beskrives udførligt og afbildes; ligesom Sabine's *L. polaris* var den uden Skjæl, men afveg fra denne ved Straaleantallet i Pectoralen, samt ved Antallet af Legemets Tverbaand. Totallængden af det største af de 2 erholdte Individer var omtrent 176mm. Først i 1876 er denne Art gjenfundet i et stort Individ fra Cumberland Gulf, ligeledes i Arctisk America. (7. *L. mucosus*, Rich.).

1857. Reinhardt, jun. „Fortegnelse over Grønlands Pattedyr, Fugle og Fiske,“ Rink, Grønl. 2 B. App. p. 22—23. Kbhvn. 1857.

Arterne *L. vahlii*, *L. reticulatus*, *L. seminudus*, *L. perspicillum*, og *L. nebulosus* opregnes som tilhørende Grønlands Fauna.

1861. Gill. “Catalogue of Fishes of the Eastern Coast of North America, from Greenland to Georgia” (Proc. Acad. Sci. Philad. 1861, Appendix p. 46. Philad. 1862).

De hidtil kjendte 7 Arter, *L. vahlii*, Reinh., *L. reticulatus*, Reinh., *L. seminudus*, Reinh., *L. perspicillum*, Kr., *L. nebulosus*, Kr., *L. mucosus*, Rich., og *L. polaris*, Sab., opregnes som tilhørende det ovennævnte Gebet.

1862. Krøyer. „Nogle Bidrag til nordisk Ichthyologie“ (Naturh. Tidsskr. 3 Række, 1 B. p. 288—294, Mai 1862. Kbhvn. 1861—63).

Krøyer giver her Diagnoser og Beskrivelser af sine i 1844 opstillede 2 Arter, *L. perspicillum* og *L. nebulosus*; af den sidstnævnte Art dog lidet udførligt.

1862. Günther. Cat. Fish. Brit. Mus. vol. 4, p. 319—326. Lond. 1862.

Fam. *Lycodidae* opføres her under Ordenen *Anacanthini*, Underordenen *Gadoidei*, og stilles som dennes 2den Familie umiddelbart foran *Gadidae* (saaledes vidt adskilt fra Familien *Blenniidae*). Familien indbefatter 3 Genera: 1. *Lycodes*, 2. *Gymnelis*, 3. *Uronectes*. Til Slægten *Lycodes* (i egentlig Forstand) henregnes og gives Diagnoser af Arterne 1. *L. vahlii*, 2. *L. perspicillum*, 3. *L. reticulatus*, 4. *L. seminudus*, 5. *L. mucosus*, og 6. *L. polaris*, men ingen nye Arter opstilles. Den anden Gruppe indbefatter de antarctiske Arter, henhørende under (Under-)Slægterne *Iluocaetes* og *Phucocaetes*, Jen., samt den senere opstillede *Paralycodes*, Bleek.

1863. Gill. “Synopsis of the Family of Lycodoidae” (Proc. Acad. Nat. Sci. Philad. 1863, p. 254—261, Sept. 1863).

Efter en almindelig Oversigt over Familien *Lycodidae*, gives en udførlig Characteristik af Slægten *Lycodes*, hvorpaa de i hans foregaaende Catalog (af 1861) opregnede 7 Arter gives sammenlignende Diagnoser, med Angivelse af Synonymer. Familien indbefatter efter hans Opfatning Underfamilierne *Zoarceinae*, *Lycodinae*, og *Gymnelinae*, en Anskuelse, der synes at have god Grund til at blive anerkjendt som naturlig.

1864. Malmgren. “Om Spetsbergens Fiskfauna” (Öfv. Kgl. Vet. Akad. Förh. 1864, p. 516—517).

2 unge Individer af *L. rossi*, n. sp. beskrives, optagne i Nord-Spitsbergen i 1861 under den første svenske Polar-Expedition. Arten ansees af Malmgren som synonym med Ross' *Blennius polaris* (fra 1828), og forskjellig fra Sabine's Art af samme Navn (fra 1824); sandsynligvis falder den sammen med *L. perspicillum*, Kr.

Malmgrens Fund af *L. rossi* omtales atter, men uden videre Bemærkninger: 1) af Malmgren 1864 i “Svenska Exp. till Spets-

exceedingly difficult, not merely owing to the defective state of the older typical specimens, but also to the fact.

In the plates to Gaimard's work on the voyage with the corvette la “Recherche” to the Artic regions, Kröyer figured the 2 specimens of *L. perspicillum* as yet obtained. There is no letter-press to this or any of the other ichthyological plates.

1855. Richardson. “Account of the Fish,” Last. Arct. Voy. Command of Sir Edw. Belcher, 1852—54, vol. 2, p. 362, Pl. XXVI. Lond. 1855.

A new species, *L. mucosus*, from Arctic America (Northumberland Sound), is fully described, and figured; it resembles Sabine's *L. polaris* in not having scales, but differs from that species in the number of pectoral rays, and in the number of transverse bands on the body. The total length of the largest of the 2 individuals obtained was about 176mm. Not till 1876 was this species again met with, in a large individual from Cumberland Gulf, also in Arctic America. (7. *L. mucosus*, Rich.).

1857. Reinhardt jun. “Fortegnelse over Grønlands Pattedyr, Fugle og Fiske,” Rink, Grønl. 2 B. App. p. 22—23. Kbhvn. 1857.

The species *L. vahlii*, *L. reticulatus*, *L. seminudus*, *L. perspicillum*, and *L. nebulosus* are enumerated as belonging to the Fauna of Greenland.

1861. Gill. “Catalogue of Fishes of the Eastern Coast of North America, from Greenland to Georgia” (Proc. Acad. Nat. Sci. Philad. 1861, Appendix, p. 46. Philad. 1862).

The 7 species as yet known, viz: *L. vahlii*, Reinh., *L. reticulatus*, Reinh., *L. seminudus*, Reinh., *L. perspicillum*, Kr., *L. nebulosus*, Kr., *L. mucosus*, Rich., and *L. polaris*, Sab., are enumerated as belonging to the Fauna of that region.

1862. Kröyer. “Nogle Bidrag til nordisk Ichthyologie” (Naturh. Tidsskr. 3 Række, 1 B. p. 288—294, May 1862. Kbhvn. 1861—63).

In this paper Kröyer gives diagnoses and descriptions of his 2 species, established 1844. *L. perspicillum* and *L. nebulosus*; those of the latter are however rather brief.

1862. Günther. Cat. Fish. Brit. Mus., vol 4, p. 319—326. Lond. 1862.

The Fam. *Lycodidæ* is classed under the order *Anacanthini*, suborder *Gadoidei*, and as the 2nd family, immediately preceding *Gadidæ* (hence widely removed from the family *Blenniidæ*). This family comprises 3 genera, viz: 1. *Lycodes*, 2. *Gymnelis*, 3. *Uronectes*. To the genus *Lycodes*, in a limited sense, are referred, and diagnoses given, of the following species: 1. *L. vahlii*, 2. *L. perspicillum*, 3. *L. reticulatus*, 4. *L. seminudus*, 5. *L. mucosus*, and 6. *L. polaris*; but no new species are established. A second group compsises the Antarctic species, belonging to the (sub-)genera *Iluocætes* and *Phucocætes*, Jen. and the subsequently established *Paralycodes*, Bleek.

1863. Gill. “Synopsis of the Family of Lycodoidæ” (Proc. Acad. Nat. Sci. Philad. 1863, p. 254—261, Sept. 1863).

After a summary review of the family *Lycodidæ*, the author gives in detail the characteristic features distinguishing the genus *Lycodes*, and then proceeds to furnish comparative diagnoses of the 7 species enumerated in his former Catalogue (1861), accompained by a list of synonyms. The family comprises, according to his view, the sub-families *Zoarceinæ*, *Lycodinæ*, and *Gymnelinæ*, which there is good reason to believe will prove correct.

1864. Malmgren. “Om Spetsbergens Fiskfauna” (Öfv. Kgl. Vet. Akad. Förh. 1864, p. 516—517).

Descriptions are given of 2 young examples of *L. rossi*, n. sp., taken on the north coast of Spitzbergen in 1861, on the first Swedish Polar Expedition. Malmgren regards the species as identical with Ross's *Blennius polaris* (1828), and differing from Sabine's species of the same name (1824); probably it is identical with *L. perspicillum*, Kr.

Malmgren's discovery of *L. rossi* is again referred to, but with no additional observations, 1) by Malmgren, 1864, in “Svenska Exp.

finde sig, men ogsaa fordi der synes at kunne raade en ganske betydelig Variation inden Individerne af samme

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bergen Ar 1864", Bihang p. 249; 2) af Frisch 1865, i hans Bearbeidelse af Malmgrens foregaaende Afhandling i Petermann, Geogr. Mittheill. 1865, Erg. Heft Nr. 16, p. 39; 3) af Heuglin 1874 i "Reisen n. dem Nordpolar-Meer 1870 u. 1871", 3 Theil, p. 215, Braunschweig 1874. (8. *L. rossi*, Malmgr.).

1866. Sars, M. „Om *Lycodes gracilis*, en ny norsk Fisk" (Forh. Vid. Selsk. Chra. 1866, p. 40—45, Pl. 1, Fig. 1—3).

Lycodes gracilis, n. sp. beskrives og afbildes efter et ungt Individ med en Totallængde af 43mm, fra 50—60 Favne i Drøbaksund i Norge. Dette Individ er dog utvivlsomt synonymt med *L. rossi*, Malmgren, og saaledes, efter hvad jeg antager, ligeledes med *L. perspicillum*, Kr. 1844, og udgjør ligesom disse sandsynligvis den spæde Unge enten af *L. reticulatus*, eller maaske af en anden nærstaaende Art. (9. *L. gracilis*, M. Sars).

1868. Esmark. „Bidrag til Finmarkens Fiskefauna" (Forh. Scand. Naturf. 10 Møde, Chra. 1868, p. 524).

3 store Individer af en *Lycodes*, som Univ.-Musæet havde modtaget fra Varangerfjorden (de 2 nedsendte i 1864, det tredie medbragt af Prof. Esmark fra en Reise i disse Egne i 1865), henføres under *L. vahlii*, Reinh. Disse Individer ere senere (1874) af nærværende Forfatter erkjendte og nærmere beskrevne som en egen Art, *L. esmarkii*.

1871. Collett. „*Lycodes sarsii*, n. sp., ex ordine Anacanthinorum Gadoideorum" (Forh. Vid. Selsk. Chra. 1871, p. 62—67, Pl. I. Chra. 1872).

L. sarsii, n. sp. beskrives og afbildes efter et (Yngel-)Individ med en Totallængde af 44mm, optaget i 1869 i Hardangerfjorden i Norge fra 100—150 Favnes Dyb. Den er ensfarvet, allerede fuldt pigmenteret, men endnu uden Skjæl; den tilhører sandsynligvis de mest anguilliforme Arter, og udgjør den spæde Unge af en maaske endnu ukjendt Art. (10. *L. sarsii*, Coll.).

1872. Gill. "Arrangement of the Families of Fishes" (Smithson. Misc. Coll. No. 247, vol. XI, Nov. 1872. Washingt. 1874).

Familien *Lycodidae* opføres her under Ordenen *Teleocephali*, Subord. *Anacanthini*. Arter omtales ikke.

1872. Gill. "Catalogue of the Fishes of the East Coast of North America" (U. S. Comm. Fish and Fisheries, Part 1, Report 1871—72, p. 796—797. Wash. 1873).

I denne reviderede og supplerede Catalog (cfr. Catalogen af 1861), er Fam. *Lycodidae* opført væsentlig i Overensstemmelse med Anordningen i foregaaende Skrift, (Smiths. Misc. Coll. vol. XI, 1872). Af Slægten *Lycodes* opregnes de samme Arter fra Nord-Americas Østkyst, som i Catalogen af 1861, men uden Diagnoser eller Beskrivelser.

1873. Fitzinger. "Versuch einer natürlichen Classification der Fische" (Sitz. Ber. Math. Nat. Cl. Akad. Wiss. 67 B. 1 Abth. Jan. 1873, p. 43. Wien 1873).

Slægten *Lycodes* opføres her blandt Ser. II. *Heterocormi*; Ord. 2. *Arthropteri*; Subord. 2. *Gastronecta*; Fam. 6. *Zoarceae* (den sidste indbefattende 1. *Zoarces*, 2. *Lycodes*). Arter omhandles ikke.

1874. Collett. „Norges Fiske" (Tillægsh. Forh. Vid. Selsk. Chra. 1874, p. 95—103. Chra. 1875).

Som tilhørende Landets Fauna omhandles de 3 Arter *L. gracilis*, M. Sars, fra Christianiafjorden, *L. sarsii*, Coll., fra Hardangerfjorden, samt *L. esmarkii*, n. sp., den sidstnævnte opstillet efter de 3 store Individer fra Finmarken (med en Totall. af 595—650mm), der af Prof. Esmark tidligere (1868) vare opførte som tilhørende *L. vahlii*, Reinh. (11. *L. esmarkii*, Coll.).

1874. Bleeker. "Typi nonnulli generici piscium neglecti" (Versl. Med. Kon. Akad. Wet. Amst. 2 R. 8 Del, p. 369. 1874).

that individuals of the same species are found to vary very considerably *inter se*, resulting partly from sexual

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till Spetsbergen, Ar 1864," Bihang, p. 249; 2) by Frisch, 1865, in his revision of Malmgren's treatise in Petermanns Geogr. Mittheill. 1865, Erg. Heft Nr. 16, p. 39; 3) by Heuglin, 1874, in "Reisen n. dem Nordpolar-Meer, 1870 u. 1871," 3 Theil, p. 215. Braunschweig 1874. (8. *L. rossi*, Malmgr.).

1866. Sars, M. "Om *Lycodes gracilis*, en ny norsk Fisk" (Forh. Vid. Selsk. Chra. 1866, p. 40—45, Pl. I, Fig. 1—3).

Lycodes gracilis, n. sp., is here described and figured from a young specimen (total length 43mm) taken at a depth of 50—60 fathoms, in Drøbaksund, Norway. This individual is unquestionably identical with *L. rossi*, Malmgr., and therefore, as I conceive, also with *L. perspicillum*, Kr. 1844; hence it probably agrees with the two latter in being a very young example of *L. reticulatus*, or some closely related species. (9. *L. gracilis*, M. Sars).

1868. Esmark. "Bidrag til Finmarkens Fiskefauna" (Forh. Scand. Naturf. 10 Møde, Chra. 1868, p. 524).

Three large examples of a *Lycodes*, obtained by the University of Christiania from the Varanger Fjord (2 of the specimens were sent in 1864, the third was brought home, in 1865, by Professor Esmark) are referred to *L. vahlii*, Reinh. Subsequently (1874) these specimens were recognised by the present author as a distinct species, *L. esmarkii*.

1871. Collett. "*Lycodes sarsii*, n. sp., ex ordine Anacanthinorum Gadoideorum" (Forh. Vid. Selsk. Chra. 1871, p. 62—67, Pl. I. Chra. 1872).

L. sarsii, n. sp., is described and figured from a (fry-)specimen, total length 44mm, taken, in 1869, in the Hardanger Fjord, Norway, at a depth of 100—150 fathoms. It is of a uniform colour, with the pigment fully developed, but exhibiting as yet no trace of scales; belongs probably to the anguilliform species, being, perhaps, a very young example of an unknown species. (10. *L. sarsii*, Coll.).

1872. Gill. "Arrangement of the Families of Fishes" (Smithson. Misc. Coll. No. 247, vol. XI, Nov. 1872. Washingt. 1874).

The family *Lycodidæ* is here classed under the order *Teleocephali*, sub-order *Anacanthini*. No species referred to.

1872. Gill. "Catalogue of the Fishes of the East Coast of North America" (U. S. Comm. Fish and Fisheries, Part 1, Report 1871—1872, p. 796—797. Wash. 1873).

In this revised and enlarged Catalogue (*vide* Catalogue 1861), the author classes the family *Lycodidæ* chiefly in accordance with the arrangement adopted in the foregoing work (Smithson. Misc. Coll. vol. XI, 1872). Of the genus *Lycodes*, he enumerates the same species from the east coast of North America as in his Catalogue of 1861, but without furnishing any diagnoses or descriptions.

1873. Fitzinger. "Versuch einer natürlichen Classification der Fische" (Sitz. Ber. Math. Nat. Cl. Akad. Wiss. 67 B. 1 Abth. Jan. 1873. p. 43. Wien 1873).

The genus *Lycodes* is here classed among Ser. II. *Heterocormi*; Ord. 2. *Arthropteri*; Sub ord. 2. *Gastronecta*; Fam. 6. *Zoarceæ* (comprising 1. *Zoarces*, 2. *Lycodes*). No species referred to.

1874. Collett. "Norges Fiske" (Tillægsh. Forh. Vid. Selsk. Chra. 1874, p. 95—103. Chra. 1875).

As comprised in the Norwegian fauna, the author enumerates the 3 species: *L. gracilis*, M. Sars, from the Christianiafjord, *L. sarsii*, Coll., from the Hardangerfjord, and *L. esmarkii*, n. sp., the last-mentioned being established from the 3 large specimens taken on the coast of Finmark (total length from 595mm to 650mm), which Prof. Esmark, in 1868, had referred to *L. vahlii*, Reinh. (11. *L. esmarkii*, Coll.).

1874. Bleeker. "Typi nonnulli generici piscium neglecti" (Versl. Med. Kon. Akad. Wet. Amst. 2 R. 8 Del, p. 369. 1874).

Art, baade grundet paa Forskjel i Kjøn, og med Hensyn til Farvetegning, Udstrækning af Skjælbeklædning, og tildels

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Som nye Slægter blandt Familien *Lycodidæ* opfører Bleeker, *Lycodalepis* for *L. mucosus*, Rich., samt *Paralycodes* for *L. variegatus*, Günth. Den sidstnævnte Art tilhører vistnok en fra den typiske *Lycodes* skilt Slægt; derimod synes Opstillingen af en særskilt Slægt for Richardson's Art, grundet paa Mangelen af Skjæl, at være overflødig, naar man tager i Betragtning den store Variation i Skjælbeklædningens Udstrækning hos de øvrige Arter.

1875. Lütken. "Revised Catalogue of the Fishes of Greenland" (Man. Nat. Hist. etc. of Greenl., prepared for the Arct. Exped. of 1875, p. 118—119. Lond. 1875).

Indeholder en Fortegnelse over de hidtil bekjendte grønlandske Arter, de samme, som i Gill's Catalog (af 1861), med en Angivelse af Synonymi.

1876. Wallace. Geographical Distribution of Animals, vol. 2, p. 439 (Lond. 1876).

Den geographiske Udbredelse af Familien *Lycodidæ* angives (i Overenstemmelse med Günthers Catalogue af 1862) til Arctisk America og Grønland, samt de antarctiske Have omkring Falklandsøerne og Chiloë. (De antarctiske Arter udgjøre dog utvivlsomt destincte Genera).

1877. Goode & Bean. "Descriptions of two new Species of Fishes, *Macrurus bairdi* and *Lycodes verrillii*" (Amer. Journ. Sci. Arts, vol. XIV, p. 473—476; Dec. 1877).

L. verrilli, n. sp. opstilles og beskrives udførligt efter 6 Individer, erholdte af U. S. Fish Commission paa 90—100 Favnes Dyb udenfor Kysterne af Nova Scotia Sommeren 1877. Arten tilhører de langstrakte Former af denne Slægt, og er blandt disse characteristisk ved at besidde Tverbaand. (12. *L. verrillii*, Goode & Bean).

1877. Malm. Götheborgs och Bohusläns Fauna, p. 502 (Götheb. 1877).

L. gracilis, M. Sars, omtales som maaske forekommende udenfor Bohuslän: en Antagelse, der blot er grundet paa Fundet af Individet i Christianiafjorden.

1878. Collett. "Fiske, indsamlede under den norske Nordhavs-Expeditions 2 første Togter, 1876 og 1877" (Forh. Vid. Selsk. Chra. 1878, No. 4, p. 11—20; Februar 1878).

Under *L. vahlii*, Reinh., henføres og beskrives et Yngel-Individ af en *Lycodes*, (der dog sandsynligvis er skilt fra denne Art, og udgjør Yngelen af *L. esmarkii*,) samt et Par (ligeledes Yngel-Individer) af den senere beskrevne *L. frigidus*. Som ny opstilles *L. muraena*, der er ensfarvet, skjælbeklædt, og tilhører de mest langstrakte Former af denne Slægt. Alle Individer vare optagne under Aarets 2det Togt, i 1877, paa Bankerne udenfor Nordland og Lofoten. (13. *L. muraena*, Coll.).

1878. Collett. "Fiske fra Nordhavs-Expeditionens sidste Togt, Sommeren 1878" (Forh. Vid. Selsk. Chra. 1878 No. 14, p. 45—77; Dec. 1878).

Af dette Togts righoldige Materiale henføres 15 Individer under en ny Art, *L. frigidus*, der er ensfarvet, skjælbeklædt, og tilhører *vahlii*-Typen, samt 2 under *L. pallidus*, n. sp., der i det hele er overensstemmende med *L. frigidus*, men har characteristiske Tegninger over Finnerne. Under *L. vahlii* henføres 3 Individer, der dog (sammen med Yngel-Individet fra forrige Aar) uden Tvivl udgjøre de hidtil ukjendte yngre Stadier af *L. esmarkii*, som danner denne Arts Repræsentant i de europæiske Dele af Ishavet. Fremdeles angives 1 Individ at tilhøre *L. seminudus*, Reinh., 3 Individer *L. muraena*, Coll., medens 1 med nogen Tvivl henføres under *L. reticulatus* (i nærværende Værk opstillet som distinct under Navn af *L. lütkeni*). Alle vare erholdte Sommeren 1878 fra Havet omkring Beeren Eiland og Spitsbergen; af de fleste gives udførlige Beskrivelser. (14. *L. frigidus*, Coll. 15. *L. pallidus*, Coll.).

differences, and partly from variation in colour and extent of scaling, as well as in the proportions of the body.

As new genera of the family *Lycodidæ*, Bleeker proposes *Lycodalepis* for *L. mucosus*, Rich., and *Paralycodes* for *L. variegatus*, Günth. The latter species belongs unquestionably to a genus distinct from the typical *Lycodes*; on the other hand, the establishment of a separate genus for Richardson's species on the basis of its not having scales, would seem superfluous, if we call to mind the great variation in the extent of the scaled integument exhibited by the other species.

1875. Lütken. "Revised Catalogue of the Fishes of Greenland" (Man. Nat. Hist. etc. of Greenland, prepared for the Arct. Exped. of 1875, p. 118—119. Lond. 1875).

Contains a list of the Greenland species known up to that time — the same as in Gill's Catalogue (1861) — with the synonyms annexed.

1876. Wallace. Geographical Distribution of Animals, vol. 2, p. 439 (Lond. 1876).

The geographical range of the family *Lycodidæ* is given (in conformity with Günther's Catalogue of 1861), as comprising Arctic America and Greenland, together with the Falkland Islands and Chiloë, in the Antarctic Ocean. (The Antarctic species belong however to distinct genera).

1877. Goode & Bean. "Descriptions of two new Species of Fishes, *Macrurus bardii* and *Lycodes verrillii*" (Amer. Jour. Sci. Arts, vol. XIV, p. 473—476; Dec. 1877).

L. verrillii, n. sp., is established and fully described from 6 specimens obtained by the U. S. Fish Commission, at a depth of 90—100 fathoms, off the coast of Nova Scotia, in the summer of 1877. This species belongs to the elongated forms of the genus, among which it is distinguished by the transverse bands. (12. *L. verrillii*, Goode & Bean).

1877. Malm. "Götheborgs och Bohusläns Fauna, p. 502 (Götheb. 1877).

L. gracilis, M. Sars, is spoken of as possibly occurring on the coast of Bohuslän, a supposition which has nothing beyond the specimen from the Christiania Fjord to support it.

1878. Collett. "Fiske indsamlede under den norske Nordhavs-Expeditions 2 første Togter, 1876 og 1877" (Forh. Vid. Selsk. Chra. 1878, No. 4, p. 11—20; Februar 1878).

The author refers to *L. vahlii*, and describes a fry-specimen of a *Lycodes*, which, however, is doubtless distinct from that species, most likely the young of *L. esmarkii*; likewise two examples (both of them very young) of *L. frigidus*, afterwards described. As new, he establishes *L. muræna*, which is scaled, uniform in colour, and the most elongated form of the genus. The specimens were all taken during the second voyage, in 1877, on the banks off the coasts of Nordland and Lofoten. (13. *L. muræna*, Coll.).

1878. Collett. "Fiske fra Nordhavs-Expeditionens sidste Togt, Sommeren 1878" (Forh. Vid. Selsk. Chra. 1878, No. 14, p. 45—77; Dec. 1878).

No less than 15 individuals of the valuable collection made on this voyage are referred to a new species, *L. frigidus*, uniform in colour, scaled, and of the *vahlii* type; 2 to *L. pallidus*, n. sp., which agrees in its chief characters with *L. frigidus*, but with distinctive markings on the fins. To *L. vahlii* are referred 3 individuals, which, however (along with the young specimen taken the year before), represent the earlier stages, unknown before, of *L. esmarkii*, the representative of *L. vahlii* in the European tracts of the Arctic Ocean. Moreover, 1 individual is referred to *L. seminudus*, Reinh., 3 to *L. muræna*, Coll., and 1 individual, though somewhat doubtfully, to *L. reticulatus* (in this General Report established as distinct, under the name of *L. lütkeni*). These specimens were all obtained in the summer of 1878, off Beeren Eiland and Spitsbergen; most of them are fully described. (14. *L. frigidus*, Coll. 15. *L. pallidus*, Coll.).

ogsaa Legemsproportionerne. Endvidere ere flere af Arterne, saavel de ældre, som de nyere, opstillede efter ganske unge

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1879. Goode & Bean. "Discoveries of the U. S. Fish Commission" (Am. Journ. Sci. Arts, vol. XVII, p. 42—43; Jan. 1869).

L. verrillii, Goode & Bean, omtales som erholdt paa 73—114 Favnes Dyb udenfor Kysterne af Nova Scotia.

1879. Collett. „Meddelelser om Norges Fiske i Aarene 1875—78", (Forh. Vid. Selsk. Chra. 1879, No. 1, p. 62; Febr. 1879).

Identiteten af *L. esmarkii* og *L. vahlii* omhandles og bekræftes fremdeles, efterat Forf. i 1878 havde medbragt fra Finmarken 2 nye, men atter fuldt udvoxede Individer af den forstnævnte Form til Universitets-Museet. Nordhavs-Expeditionens Yngel-Individer af *L. frigidus* fra Bankerne udenfor Lofoten anføres som gaaende ind under Norges Fauna.

1879. Bean. "Fishes collected in Cumberland gulf and Disco Bay" (Bull. U. S. Nat. Mus. No. 15, p. 112—115; Contrib. to the Nat. Hist. of Arct. Am. by L. Kumlien; 23de Mai 1879).

Af *L. mucosus*, Rich. 1855, hvoraf tidligere vare blot kjendte de 2 Typ-Individer fra Northumberland Sound, erholdtes et nyt Individ i Cumberland Gulf i 1876. Totallængden var 430mm; Richardsons originale Beskrivelse bliver i alle væsentlige Henseender bekræftet.

1879. Collett. "On a new Fish of the Genus *Lycodes* from the Pacific" (Proc. Zool. Soc. Lond. 1879, p. 381—382).

L. pacificus, n. sp., angivelig fra Japan og tilhørende Berliner-Museet, beskrives og afbildes i et Træsnit. Paa Grund af de manglende Vomerin- og Palatintænder antages den maaske rettere at henføres under en egen Underslægt, for hvilken Navnet *Lycodopsis* er foreslaaet. (16. *L.* [*Lycodopsis*] *pacificus*, Coll.)

1879. Bean. "Description of a species of *Lycodes* (*L. turneri*) from Alaska" (Proc. U. S. Nat. Mus. vol. I; 22de April 1879; Wash. 1879).

En ny Art, den 2den fra det stille Hav, opstilles og beskrives nøjagtigt, efter et Individ med en Totallængde af 330mm, under Navn af *L. turneri*. Den tilhører de skjælløse Arter, hvoraf der egentlig blot existerer 1 sikker Art foruden denne, nemlig *L. mucosus*, Rich.; af de øvrige Arter, der ere beskrevne som skjælløse, er nemlig den ene utilstrækkeligt beskreven, og ikke senere gjenfunden (*L. polaris*, Sab.), og de 2, *L. rossi*, Malmgr., og *L. gracilis*, M. Sars, ere Yngelstadier af andre, skjælbeklædte Former, hvilket maaske ogsaa gjælder om den 4de, *L. sarsii*, Coll. Farven er hos denne Art mørk med lyse Tverbaand; Legemet og Tandbygningen typiske.

(17. *L. turneri*, Bean 1879).

1879. Goode & Bean. "Descr. of a species of *Lycodes* (*L. paxillus*) obtained by the U. S. Fish Comm." (Proc. U. S. Nat. Mus. vol. II, p. 44—46; 22de Marts [trykt 23de Maj] 1879).

Den nye Art, *L. paxillus*, opstilles efter et enkelt, ikke fuldkommen uskadt Individ med en Totallængde af 363mm fra Kysterne af Nova Scotia. Som characteristiske Kjendetegn opgives det særdeles korte Hoved, en ejendommelig Krumning af Overkjæven, den stærke Udvikling af Kjævernes Muskler, og de faatallige Pectoralstraaler. Den tilhører de langstrakte Former, og har et trindt, skjælbeklædt, og ensfarvet Legeme. (18. *L. paxillus*, Goode & Bean).

1879. Goode & Bean. "On the occurrence of *Lycodes vahlii*, Reinhardt, on la Have and Grand Banks" (Proc. U. S. Nat. Mus. vol. 2, p. 209—210; 21de Maj [trykt 6te Dec.] 1879).

2 Individer af, hvad der antages at være *L. vahlii*, Reinhardt, optoges paa Bankerne søndenfor Nova Scotia i Løbet af 1879. Totallængden af de erholdte Individer var 540 og 632mm. Jeg skal senere vise, at disse Individer ere identiske med *L. esmarkii*, idet jeg har været sat istand til at anstille en directe Undersøgelse mellem et af disse Individer, og Typ-Exemplarerne af den nævnte Art.

Moreover, several of the species, both the old and the new, are established from specimens in a very early stage of

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1879. Goode & Bean. "Discoveries of the U. S. Fish Commission" (Am. Journ. Sci. Arts, vol. XVII, p. 42—43; Jan. 1869).

L. verrillii, Goode & Bean, is mentioned as having been taken, at a depth of 73—114 fathoms, off the coast of Nova Scotia.

1879. Collett. "Meddelelser om Norges Fiske i Aarene 1875—78" (Forh. Vid. Selsk. Chra. 1879, No. 1, p. 62; Febr. 1879).

Here too, the identity of *L. esmarkii* and *L. vahlii* is dwelt upon and maintained, the author having, in 1878, brought from Finmark to the University Museum two full-grown examples of the former. The fry-specimen of *L. frigidus*, taken on the North Atlantic Expedition in 1878, on the banks off the Lofoten coast, is mentioned as comprised in the Norwegian Fauna.

1879. Bean. "Fishes collected in Cumberland Gulf and Disco Bay" (Bull. U. S. Nat. Mus. No. 15, p. 112—115; Contrib. to the Nat. Hist. of Arct. Am., by L. Kumlien; 23rd May 1879).

Of *L. mucosus*, Rich. 1855, previously represented by the 2 typical specimens from Northumberland Sound, a new example was taken in Cumberland Gulf, in 1876, having a total length of 430mm. Richardson's original description is confirmed in all essential particulars.

1879. Collett. "On a new Fish of the Genus *Lycodes* from the Pacific" (Proc. Zool. Soc. Lond. 1879, p. 381—382).

L. pacificus, n. sp. (preserved in the Berlin Museum), stated to be from Japan, is here described and figured. The species being without vomerine and palatine teeth should, perhaps, be classed under a separate sub-genus, for which the name of *Lycodopsis* is suggested. (16. *L.* [*Lycodopsis*] *pacificus*, Coll.).

1879. Bean. "Description of a species of *Lycodes* (*L. turneri*) from Alaska" (Proc. U. S. Nat. Mus. vol. I; 22th April 1879; Wash. 1879).

A new species, the second met with in the Pacific Ocean, is here established and fully described, from an individual having a total length of 330mm, under the name of *L. turneri*. It belongs to the scaleless species, of which, in a strict sense, but one other true species is known to exist, viz. *L. mucosus*, Rich.; for, of the remaining species stated to be scaleless, 1 is imperfectly described, and has not since been met with (*L. polaris*, Sab.); and 2, *L. rossi*, Malmgr., and *L. gracilis*, M. Sars, are other, scaled forms in the fry stage of development, which, perhaps, is also the case with the fourth, *L. sarsii*, Coll. The colour is dark, with light transverse bands; body and structure of teeth typical. (17. *L. turneri*, Bean 1879).

1879. Goode & Bean. "Descr. of a species of *Lycodes* (*L. paxillus*) obtained by U. S. Fish Comm." (Proc. U. S. Nat. Mus. vol. II, p. 44—46; 22nd March [printed 23rd May] 1879).

The new species, *L. paxillus*, is described from a single individual, not wholly free from mutilation, with a total length of 363mm, taken on the coast of Nova Scotia. Its characteristic features are stated to be the short head, a peculiar curvature of the upper jaw, the powerful development of the maxillary muscles, and the small number of pectoral rays. It belongs to the elongated forms, and has a plump, scaled body, uniform in colour.

(18. *L. paxillus*, Goode & Bean).

1879. Goode & Bean. "On the occurrence of *Lycodes vahlii*, Reinhardt, on la Have and Grand Banks" (Proc. U. S. Nat. Mus. vol. 2, p. 209—210; 21st May [printed 6th Dec.] 1879).

Two individuals, believed to belong to *Lycodes vahlii*, Reinhardt, — total length respectively 540mm and 632mm; — were taken on the banks south of Nova Scotia, in 1879. I shall subsequently show that these individuals are identical with *L. esmarkii*, having had an opportunity of instituting a direct comparison between one of them and the typical specimens of that species.

Individer, tildels Yngel, hvoraf der kan have foreligget blot et enkelt Individ til Undersøgelse, og det lader sig nu i flere Tilfælde directe paavise, at Yngel-Individer af denne Slægt kunne frembyde en betydelig Ulighed med de ældre af samme Art. Med fuld Sikkerhed at henføre alle disse Yngel-Individer, der endnu opføres under sine særegne Navne i Musæer og i Skrifter, til sin rette Plads, er derfor ofte vanskeligt eller endog umuligt; og denne Usikkerhed vil først forsvinde, naar der foreligger langt større Rækker af de forskjellige Udviklingsstadier, end det for Tiden er Tilfældet.

Det under Nordhavs-Expeditionen vundne Materiale maa vistnok kaldes forholdsvis betydeligt, idet der indsamledes ialt 29 Individer, henhørende efter min Antagelse under 6 forskjellige Arter, men som dog ikke er tilstrækkeligt til overalt at bringe fuld Klarhed i Forholdet mellem disse Arter og de allerede bekjendte.

Ved den endelige Bearbejdelse af dette Materiale har jeg havt en værdifuld Bistand af Dr. Lütken, som samtidigt har underkastet de i Kjøbenhavns Universitets-Musæum opbevarede Typer fra Grønland en nøjere Gjennemgaaelse; fremdeles har jeg ved denne Naturforskers Velvilje været sat istand til under et Par Ophold i Kjøbenhavn personlig at kunne undersøge disse Typexemplarer. Dette har havt til Følge, at jeg nu har troet at burde i enkelte Puncter modificere min tidligere provisorisk givne Opfatning af de under Expeditionen og de øvrige ved de norske Kyster erholdte Former. Det hele Antal af de hidtil under særegne Navne opstillede Arter af denne Slægt er 19, hvortil kommer den i nærværende General-Beretning beskrevne nye Art, *L. lütkenii.*

At forsøge paa at reducere til sit rette Antal alle disse 20 hidtil beskrevne Arter, hvoraf idetmindste et Par, efter min Opfatning, bestemt ikke kunne ansees for at

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1879. Goode & Bean. "List of the Fishes of Essex County, including those of Mass. Bay" (Bull. Ess. Inst. vol. IX, p. 1—38, Salem 1879).

Som erholdte udenfor Kysterne af Maine og Nova Scotia i de senest forløbne Aar omtales af Lycoder Arterne *L. verrillii*, *"L. vahlii"*; og *L. paxillus.*

1880. Lütken. „Korte Bidrag til nordisk Ichthyographi. III: Grønlands og Islands Lycoder" (Vid. Medd. Naturh. Foren. Kbhvn. 1880; p. 307—332; meddelt 6te Febr. 1880).

Indeholder en critisk Gjennemgaaelse af det i Musæet i Kjøbenhavn opbevarede Materiale af Lycoder fra Grønland og Island, der indeholder Typerne for de fleste af Reinhardt og Krøyer beskrevne Arter. Forfatteren characteriserer *L. vahlii*, *L. reticulatus* og *L. seminudus*, og antager den førstnævnte skilt fra *L. esmarkii*. Som ny opstilles *L. lugubris* fra Island, en Art, der i Legemsform, Skjælbeklædning og Sidelinie kommer *L. vahlii* nær, men skiller sig fra denne ved færre Pectoralstraaler, kortere Tandrække paa Palatinbenene, samt ensartet graabrun Farve uden Baand eller Pletter. Fremdeles gjør Forfatteren Rede for sin Opfatning af flere af de øvrige Lycoder, og giver til Slutning en kort Oversigt over de grønlandske og islandske Arter tilligemed dem af de øvrige Arter, hvorom han har personlig Kundskab (dog uden nærmere at characterisere disse sidste).

(19. *L. lugubris*, Lütk.).

growth, nay, some from fry, of which, maybe, but a solitary individual was at hand for examination; and in many cases, it now admits of the clearest proof that fry and adult individuals of the same species exhibit a marked dissimilarity. Therefore, to classify aright the numerous fry-specimens, for which, in museums and ichthyological works, a specific name continues to be employed, is exceedingly difficult, or rather impossible; and this uncertainty will not cease to be felt till specimens representing the various stages of development shall have been obtained in greater number.

The results of the North Atlantic Expedition, as affecting this question, must certainly be regarded as considerable, 29 individuals, belonging, I conceive, to 6 different species, having been collected, — though insufficient for fully elucidating the relation between these new species and those already known.

When engaged in working up these materials, I received valuable assistance from Dr. Lütken, who also submitted the typical specimens from Greenland, preserved in the Copenhagen University Museum to a critical examination; and that naturalist having kindly permitted me to examine those specimens when, on one or two occasions, I visited Copenhagen, I have seen fit, in some respects, to modify my former, to a certain extent preliminary, views concerning forms obtained on the Expedition and off the coasts of Norway. The whole number of species hitherto instituted under special names is 19, exclusive of the new species, *L. lütkenii*, established in this General Report.

An attempt to reduce to their true number the 20 forms as yet described, some of which, in my opinion, cannot be regarded as distinct species, is hardly pos-

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1879. Goode & Bean. "List of the Fishes of Essex County, including those of Mass. Bay" (Bull. Ess. Inst. vol. IX, pp. 1—38, Salem 1879).

Among the various species of *Lycodes* obtained of late years off the coasts of Maine and Nova Scotia are mentioned *L. verrillii*, *"L. vahlii,"* and *L. paxillus.*

1880. Lütken. "Korte Bidrag til nordisk Ichthyographi. III. Grønlands og Islands Lycoder." (Vid. Medd. Naturh. Foren. Kbhvn. 1880, pp. 307—232; read Feb. 6th 1880).

In this Memoir are embodied the results of a critical examination of the specimens from Greenland and Iceland preserved in the Zoological Museum in Copenhagen, which comprise the types of most of the species described by Reinhardt and Kröyer. The author characterises *L. vahlii*, *L. reticulatus*, and *L. seminudus*, and regards the first of these species as distinct from *L. esmarkii*. As a new species, he establishes *L. lugubris*, from Iceland, which, as regards the structure of the body, the scaled integument, and the lateral line, bears considerable resemblance to *L. vahlii*, but is distinguished from it by having fewer pectoral rays, a shorter series of teeth on the palatine bones, and a uniform grayish-brown colour, without either bands or spots. Moreover, the author explains his views concerning several of the other *Lycodes*, and gives in conclusion a summary of the Greenland and Iceland species, together with such of the remaining species as are known to him from autopsy, without however diagnosticating the latter.

19. *L. lugubris*, (Lütk.).

repræsentere virkelige Arter, lader sig neppe iværksætte med det Materiale, der for Tiden staar til vor Raadighed. Den nedenstaaende Oversigt kan derfor blot ansees som et foreløbigt Forsøg paa deres Gruppering.

A. *Tænder i Kjæverne, paa Vomer og paa Palatinbenene* (**Lycodes**, Reinh. 1830—31).

I. Legemsbygningen typisk; Legemets Høide indeholdes 6—10 Gange i Totallængden.

a. Legemet hos de udvoxede helt el. delvis skjælbeklædt.

1. *L. vahlii*, Reinh. 1830—31. Grønland.
2. *L. reticulatus*, Reinh. 1834—35. Grønland.
   L. polaris, Ross (nec Sab.) 1828; Spitsbergen. *L. perspicillum*, Kr. 1844; Grønland. *L. rossi*, Malmgr. 1864; Spitsbergen. *L. gracilis*, M. Sars 1866; Christianiafjorden (Norge).
3. *L. seminudus*, Reinh. 1838. Grønland; Spitsbergen.

(4) *L. nebulosus*, Kr. 1844. Grønland. (Utilstrækkeligt beskreven, og ubestemmelig).

5. *L. esmarkii*, Coll. 1874. Finmarken; Spitsbergen; Nova Scotia.
6. *L. frigidus*, Coll. 1878. Spitsbergen; Beeren Eiland; Norges NV.-Kyst.
7. *L. pallidus*, Coll. 1878. Spitsbergen.
8. *L. lugubris*, Lütk. 1880. Island.
9. *L. lütkenii*, n. sp. Spitsbergen.

b. *Legemet i alle Aldre nøgent.* (*Lycodalepis*, Bleek. 1874).

(10) *L. polaris*, Sab. 1824. Arctisk America. (Utilstrækkeligt beskreven, og ubestemmelig).

11. *L. mucosus*, Rich. 1855. Arctisk America.
12. *L. turneri*, Bean 1879. Alaska (Russisk N. America).

II. Legemsbygningen langstrakt; Legemets Høide indeholdes 12—24 Gange i Totallængden.

13. *L. sarsii*, Coll. 1871. Hardangerfjord (Norge). (Blot kjendt i et Yngel-Individ).
14. *L. muraena*, Coll. 1878. Spitsbergen; Beeren Eiland; Norges NV.-Kyst.
15. *L. verrillii*, Goode & Bean 1879. Nova Scotia (N. Americas Østkyst).
16. *L. paxillus*, Goode & Bean 1879. Nova Scotia (N. Americas Østkyst).

B. *Tænder i Kjæverne, ingen paa Vomer eller Palatinbenene* (**Lycodopsis**, Coll. 1879).

17. *L. pacificus*, Coll. 1879. Japan.

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18. **Lycodes esmarkii**, Coll. 1874.

Pl. II, Fig. 19—21; Pl. III, Fig. 22.

Lycodes esmarkii, Coll. Norges Fiske, Tillægsh. til Forh. Vid. Selsk. Chra. 1874, p. 95, Chra. 1875 (1874).
Lycodes vahlii, Coll. (nec Reinh.) Forh. Vid. Selsk. Chra. 1878, No. 4, p. 11, Febr. 1878; No. 14, p. 54, Dec. 1878; Chra. 1879 (1878).
Lycodes vahlii, Goode & Bean, Proc. U. S. Nat. Mus. vol. 2, p. 209 (1879).

sible with the comparatively meagre stock of materials now before us. The subjoined summary is therefore to be regarded merely as a preliminary attempt towards the grouping of this genus.

A. *Teeth in the jaws, on the vomer, and the palatine bones* (**Lycodes**, Reinh. 1830—31).

I. Structure of the body typical; height of the body contained from 6 to 10 times in the total length.

a. The body in adults more or less scaled.

1. *L. vahlii*, Reinh. 1830—31. Greenland.
2. *L. reticulatus*, Reinh. 1834—35. Greenland.
   L. polaris, Ross (nec Sab.) 1828; Spitzbergen. *L. perspicillum*, Kr. 1844; Greenland. *L. rossi*, Malmgr. 1864; Spitzbergen. *L. gracilis*, M. Sars 1866; the Christiania Fjord (Norway).
3. *L. seminudus*, Reinh. 1838. Greenland; Spitzbergen.

(4) *L. nebulosus*, Kr. 1844. Greenland. (Insufficiently described, and indeterminable).

5. *L. esmarkii*, Coll. 1874. Finmark; Spitzbergen; Nova Scotia.
6. *L. frigidus*, Coll. 1878. Spitzbergen; Beeren Eiland; North-west coast of Norway.
7. *L. pallidus*, Coll. 1878. Spitzbergen.
8. *L. lugubris*, Lütk. 1880. Iceland.
9. *L. lütkenii*, n. sp. Spitzbergen.

b. The body naked in all stages of growth (*Lycodalepis*, Bleek. 1874).

(10) *L. polaris*, Sab. 1824. Arct. America. (Insufficiently described, and indeterminable).

11. *L. mucosus*, Rich. 1855. Arct. America.
12. *L. turneri*, Bean 1879. Alaska (Russian N. America).

II. The body elongate; height of the body contained from 12 to 24 times in the total length.

13. *L. sarsii*, Coll. 1871. The Hardanger Fjord (Norway). (Known only from a fry-specimen).
14. *L. muraena*, Coll. 1878. Spitzbergen; Beeren Eiland; North-west coast of Norway.
15. *L. verrillii*, Goode & Bean 1879. Nova Scotia (N. America).
16. *L. paxillus*, Goode & Bean 1879. Nova Scotia (N. America).

B. *Teeth in the jaws; none on the vomer or the palatine bones.* (**Lycodopsis**, Coll. 1879).

17. *L. pacificus*, Coll. 1879. Japan.

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18. **Lycodes esmarkii**, Coll. 1874.

Pl. II, fig. 19—21; Pl. III, fig. 22.

Lycodes esmarkii, Coll. Norges Fiske, Tillægsh. til Førh. Vid. Selsk. Chra. 1874, p. 95, Chra. 1875 (1874).
Lycodes vahlii, Coll. (nec Reinh.) Forh. Vid. Selsk. Chra. 1878 No. 4, p. 11, Feb. 1878; No. 14, p. 54, Dec. 1878; Chra. 1879 (1878).
Lycodes vahlii, Goode & Bean, Proc. U. S. Nat. Mus. vol. 2, p. 209 (1879).

Diagn. *Farven brunsort, med hvidgul Nakkeplet, og med 5—8 hvidgule Tverbaand, der gaa ud over Dorsalen, bagtil ogsaa ud over Analen; hos fuldt udvoxede Individer ere Tverbaandene opløste i ringformige, af Bundfarven opfyldte Pletter, der nedtil kunne være utydelige, eller ogsaa indbyrdes sammenhængende. Skjællene beklæde hele Legemet indtil foran Dorsalerne, fremdeles Dorsalen og Analen indtil henimod deres Rande; fuldt udvoxede Individer have tillige Nakken og Roden af Pectoralerne skjælbeklædt, samt tildels spredte Skjæl paa Panden. Legemets Højde indeholdes 7—8, hos smaa Unger 9—10 Gange i Totallængden. Hovedet har stump Snude, og indeholdes* $4\frac{1}{3}$—$4\frac{1}{2}$ *Gange i Totallængden; Tandrækken paa Palatinbenene kortere, end Mellemkjævens, og naar hos gamle Individer neppe dennes halve Længde. Overkjæven aldrig længere, end det halve Hoved. Pectoralerne, der indeholdes hos yngre neppe 8 Gange, hos fuldt udvoxede Hanner omtrent 9 Gange i Totallængden, ere hos de første tydeligt indskaarne i Yderranden. Sidelinien dobbelt, lige bag Pectoralfæstet delt i en mediolateral og en ventral Gren; hos udvoxede utydelig. Appendices pyloricæ mangle. Størrelsen indtil 595*mm *(Hunnen), eller 622*mm *(Hannen), og derover.*

M. B. 6. D. + $\frac{1}{2}$ *C. 102—118; A. +* $\frac{1}{2}$ *C. 88—102;*
P. 20—23; V. 4.

Localit. fra Nordh. Exped. Bankerne udenfor Lofoten i Norge; Nordvestkysten af Spitsbergen.

	Stat. 124.	*Stat.* 362.	*Stat.* 363.
Beliggenhed.	325 Kil. VSV. Bodø, Norge.	115 Kilom. V. Norskøerne, Sptb.	60 Kil. V. Norskøerne, Sptb.
Dybde.	350 Favne (640m).	459 Favne (839m).	260 Favne (475m).
Temp. paa Bunden.	÷ 0.9° C.	÷ 1.0° C.	+ 1.1° C.
Bunden.	Ler.	Blaagraat Ler.	Blaaler.
Datum.	19de Juni 1877.	14de Aug. 1878.	14de Aug. 1878.
Antal Individer.	1 spæd Unge.	2 Indiv.	1 Unge.

Bemærkninger til Synonymien. Spørgsmaalet om, under hvilken af de hidtil bekjendte Lycoder de 4 under Nordhavs-Expeditionen erholdte Individer, hvilke i mine foreløbige Beretninger have været omtalte under Navnet *L. vahlii*, Reinh., burde henføres, har ikke været løst uden efter nogen Tvivl. Allerede i disse Beretninger har jeg paavist, at de i alle væsentlige Henseender gaa ind under Reinhardts Beskrivelse af *L. vahlii*, og jeg troede derfor at burde henføre dem under denne Art, skjønt Original-Exemplarerne i det zoologiske Museum i Kjøbenhavn og Berlin, hvilke jeg ved Dr. Lütkens og Prof. Peters' Imødekommenhed har havt Lejlighed til at underkaste en (omend flygtig) Undersøgelse, frembød visse iøjnefaldende Uligheder; dog vare intet af disse Exemplarer af det samme Alderstrin, som Nordhavs-Expeditionens, ligesom de vare idethele

Diagnosis. — *Colour brownish-black, with a whitish yellow patch on the nape and 5—8 transverse bands of the same colour across the dorsals, and, posteriorly, across the anal; in full-grown individuals, the bands are broken up into annular spots, filled with the ground colour; below, sometimes indistinct or contiguous. The scales cover the body to the region in front of the dorsals, also the dorsals and the anal, nearly to their margins; adults have the nape and the base of the pectorals scaled, and sometimes isolated scales on the forehead. The height of the body is to the total length as 1 to 7—8; in very young individuals, as 1 to 9—10. Snout obtuse, length of head to total length as 1 to* $4\frac{1}{3}$—$4\frac{1}{2}$*; the dental series on the palatine bones are shorter than those on the intermaxillaries, and, in old individuals, scarcely attain half the length of the latter. The upper jaw never longer than half of the head. The pectorals, in young examples scarcely* $\frac{1}{8}$*, in full-grown males about* $\frac{1}{9}$ *of the total length, are in the former distinctly notched along their outer margin. Lateral line double, being divided immediately posterior to the origin of the pectorals into a medio-lateral and a ventral branch; indistinct in full-grown specimens. Pyloric appendages wanting. Length reaching 595*mm *(female) or 622*mm *(male), and above.*

M. B. 6. D. + $\frac{1}{2}$ *C. 102—118; A. +* $\frac{1}{2}$ *C. 88—102;*
P. 20—23; V. 4.

Locality (North Atl. Exped.): — The banks off Lofoten, in Norway. The north-west coast of Spitzbergen.

	Stat. 124.	*Stat.* 362.	*Stat.* 363.
Exact Locality.	325 Kil. WSW. of Bodø, Norway.	115 Kil. W. of Norskøerne, Sptb.	60 Kil. W. of Norskøerne, Sptb.
Depth.	350 Fathoms (640m).	459 Fathoms (839m).	260 Fathoms (475m).
Temp. at Bottom.	÷ 0.9° C.	÷ 1.0° C.	+ 1.1° C.
Bottom.	Clay.	Bluish-grey Clay.	Blue Clay.
Date.	19th June 1877.	14th Aug. 1878.	14th Aug. 1878.
Numb. of Specim.	1 Ind. (very young).	2 Indiv.	1 Indiv. (young).

Remarks on the Synonymy. — The question, as to which of the species of *Lycodes* hitherto known the 4 individuals taken on the North Atlantic Expedition, which, in my previous, preliminary reports, are mentioned under the name *L. vahlii*, should be referred, has proved somewhat difficult to decide. In the said reports I have shown that, in all essential particulars, they agree with Reinhardt's description of *L. vahlii*; and hence I deemed they might be correctly referred to that species, notwithstanding the original specimens in the zoological museums of Copenhagen and Berlin, which Dr. Lütken and Professor Peters kindly afforded me an opportunity of examining, with regard to certain features, exhibited a striking dissimilarity; none of these specimens, however, were in the same stage of growth as those taken on the Expedition; their state of

ikke vel vedligeholdte, saaledes at flere Charaeterer under den flygtige Gjennemgaaelse ikke lode sig med Sikkerhed erkjende.

Dr. Lütken har imidlertid senere under Revisionen af de Individer af denne Slægt, der opbevares i Kjøbenhavner-Musæet, bleven opmærksom paa visse, af Reinhardt overseede eller lidet paaagtede Ejendommeligheder hos *L. vahlii*, og det er i Overensstemmelse med disse sidst fundne Resultater, som han har nedlagt i sit sidste, ovenfor nævnte Artikel om denne Slægts grønlandske og islandske Arter[1], at jeg har troet det rettest at holde Nordhavs-Expeditionens Individer ud fra den typiske *L. vahlii*, væsentlig paa Grund af Forskjel i Sideliniens Bygning, i Hovedets og Kjævernes relative Længde, i Tandbygningen, foruden i Farven.

Medens *L. vahlii* typisk besidder 1 Sidelinie, der er ventral, har Nordhavs-Expeditionens Individer 2, nemlig tillige en medio-lateral; dog maa hertil bemærkes, at et af Typ-Exemplarerne af *L. vahlii* tillige viser Spor af en medio lateral Sidelinie.

Medens Hovedets Længde hos *L. vahlii* indeholdes hos yngre Hun-Individer 5,4 Gange i Totallængden, og saaledes er forholdsvis lidet, hos gamle Hanner derimod 4,3, er Forholdet hos Nordhavs-Expeditionens Individer hos intet Kjøn over 4,6, selv hos smaa Unger. Fremdeles er Tandrækken paa Palatinbenene hos *L. vahlii* i Regelen længere, end Rækken i Mellemkjæven (ialfald ikke, eller kun lidet kortere, end denne), medens den hos Nordhavs-Expeditionens Individer altid er kortere, tildels naaende blot den sidstes halve Længde. Endelig er Farven hos begge ulige, hvorved dog maa erindres, at Typ-Exemplarerne af *L. vahlii* ikke ere fuldt ud skikkede til at oplyse dette Forhold, dels fordi de ere gamle (fra 40-aarene), dels fordi de i Regelen have været udtagne af Ventriklerne paa Hajer; enkelte ere dog forholdsvis vel vedligeholdte. Medens nemlig *L. vahlii* er forsynet med større mørke Tverfelter ned ad Legemet og de verticale Finner, mellem hvilke Felter findes omtrent lige saa brede Partier af en lysere Bundfarve (der hos gamle Individer synes ganske at forsvinde, saaledes, at Legemet her bliver næsten ensfarvet brunsort), have Expeditionens Individer paa brunsort Bundfarve et Antal skarpt begrændsede hvidgule Tverbaand, der ere forholdsvis smale, og paa Dorsalen ere næsten hvide, ligesom der hos alle de undersøgte Individer findes en hvid Plet ovenfor hver Gjællespalte.

Med Hensyn til Benævnelsen *L. esmarkii*, og de nye Individers Identification med denne Art, efterat jeg tidligere havde opført dem under Navnet *L. vahlii*, kan følgende bringes i Erindring.

Da jeg i 1874 udarbejdede min Afhandling om „Norges Fiske" (Tillægsh. til Forh. Vid. Selsk., Chra.), forelaa til Bestemmelse i Universitets-Musæet 3 store Individer af

[1] Vid. Medd. Nat. Foren. Kbhvn. 1880, p. 307.

preservation, too, is anything but good, so that several of the characters could not be accurately determined from a cursory examination.

But Dr. Lütken, when re-examining the specimens of this genus preserved in the Copenhagen Museum, had his attention drawn to divers characteristics distinguishing *L. vahlii*, which Reinhardt must have either overlooked or thought undeserving of notice; and in conformity with these results, which he has embodied in his latest Memoir, on the Greenland and Iceland species of this genus,[1] I have seen fit to regard the individuals taken on the North Atlantic Expedition as distinct from the typical *L. vahlii*, chiefly by reason of differences in the character of the lateral line, in the relative length of the head and jaws, in the structure of the teeth, and in the colour.

L. vahlii is typically distinguished by one lateral line, which is ventral, whereas the specimens from the Expedition have two, a ventral and a medio-lateral; it must however be admitted, that one of the typical specimens of *L. vahlii* exhibits traces of a medio-lateral line.

The length of the head in *L. vahlii* is in young female individuals 5.4 of the total length, and therefore comparatively short, in old males 4.3; whereas in the specimens from the North Atlantic Expedition, the proportion does not exceed in either sex 4.6, even in very young individuals; moreover, the row of teeth on the palatine bones in *L. vahlii* is as a rule longer than that on the inter-maxillary, and, when shorter, but very little, whereas it is invariably shorter in the specimens obtained on the North Atlantic Expedition, sometimes reaching not more than half the length of the latter. Finally, they differ in colour; it must, however, be borne in mind, that the typical specimens of *L. vahlii* are not in a condition fully calculated to elucidate this question, partly from their age (upwards of 40 years in the Museum), and partly from their having in the majority of cases been taken from the ventricles of sharks; one or two are, however, comparatively well preserved. *L. vahlii* is distinguished by large, dark transverse quarterings down the body and the vertical fins, with rather broad patches between, of a lightish ground-colour, which in old individuals would appear to become obsolete, the body here being almost uniformly brownish-black; the specimens of the Expedition have the brownish-black ground-colour marked with a number of sharply defined whitish-yellow (on the dorsal almost white) transverse bands; a white spot occurs too above each of the gill-openings.

As regard the name *L. esmarkii*, and the identification of the new individuals with that species (I had previously referred them to *L. vahlii*), the following remarks should be borne in mind.

In 1874, when I was occupied in writing my treatise on "Norges Fiske" (Tillægsh. til Forh. Vid. Selsk., Chra.), the University Museum had 3 large specimens of a *Lycodes*,

[1] Vid. Medd. Nat. Foren. Kbhvn. 1880, p. 307.

en *Lycodes*, fangne i Varangerfjorden i Finmarken, de 2 nedsendte af Lensmand Klerk i 1864, det 3die erhvervet i 1865 paa Stedet af Professor Esmark. Senere har jeg (1876) under et Ophold i Finmarken erholdt 2 nye Individer fra denne Localitet; alle ere de fuldstændig overensstemmende indbyrdes, og da deres Totallængde ligger mellem 575 og 622mm, udgjøre de Kjæmpe-Individer af denne Slægt.

Da de nævnte Individer i flere Henseender frembøde en Uoverensstemmelse med Reinhardt's Beskrivelse af *L. vahlii*, hvilket end mere bestyrkedes, efterat jeg gjennem Dr. Lütken havde erholdt et af Typ-Exemplarerne udlaant til umiddelbar Sammenligning, opstilledes de i den nævnte Afhandling som en ny Art, *L. esmarkii*. Senere har jeg dog, inden Dr. Lütken har iværksat sine nye Undersøgelser af *L. vahlii*, troet at burde opfatte disse Uoverensstemmelser som mindre væsentlige, og at opføre *L. esmarkii* i Synonymernes Række, hvad jeg ved et Par Lejligheder, og sidst i den omtalte foreløbige Beretning om Nordhavs-Expeditionens Materiale, har gjennemført.

Den ene af de Characterer, der adskilte *L. esmarkii* fra *L. vahlii*, var Farven, der nemlig var brunsort med et Antal smale, hvidagtige Tverbaand, som dels i Midten indesluttede Felter af den mørke Bundfarve, dels vare opløste i ringformige Tegninger, der nedtil kunde være indbyrdes forbundne med Ringene af næste Tverbaand[1].

Det er overvejende sandsynligt, at Nordhavs-Expeditionens nye Individer udgjøre de yngre Stadier af denne, som *L. esmarkii* beskrevne Form. Overensstemmelserne mellem dem ere gjennemgaaende; i de samme Puncter, hvori Nordhavs-Expeditionens Individer afvige fra den typiske *L. vahlii*, stemme de overens med Typ-Exemplarerne af *L. esmarkii*, ihvorvel en mindre Forskjel hist og her kan iagttages, der dog vel kan tilskrives den store Forskjel i Alder og Størrelse. Dette er saaledes Tilfældet med Farvetegningen; fremdeles har Skjælbeklædningen faaet en større Udstrækning hos Typ-Exemplarne af *L. esmarkii*, idet der foruden spredte Skjæl paa Panden og fuldt Skjælbelæg paa Nakken ogsaa her vil findes et lignende paa den indre Del af Pectoralerne.

Det endelige Resultat bliver saaledes, at Nordhavs-Expeditionens Individer, der samtlige ere yngre, vistnok ere identiske med den hidtil blot i fuldt udvoxede Indivi-

[1] Den anden Character, ifølge hvilken jeg ved Opstillingen af den nye Art troede at burde adskille den fra *L. vahlii*, og som var hentet fra Skjælbeklædningen, er af mindre Betydning, men maa her berøres, fordi den i den originale Beskrivelse var Gjenstand for Mistydning. Naar *L. esmarkii* nemlig opgaves som skjælbeklædt lige ud til Snuden, medens *L. vahlii* havde nøgent Hoved, var dette ucorrect, idet de som Skjæl antagne Dannelser hos den førstnævnte Art blot vare de tætstaaende, næsten cirkelrunde Indtryk i Huden, der vare fremkomne under dennes Sammentrækning. Blot efter en senere omhyggelig Undersøgelse af de foreliggende 5 Individer har jeg kunnet opdage enkelte isolerede Skjæl paa Panden, der utvivlsomt ere tilkomne i den senere Alder.

from the Varanger Fjord, in Finmark; 2 of the individuals had been presented by Lensmand Klerk, in 1864, the third was obtained on the spot by Professor Esmark, in 1865. During a short stay in Finmark (1876), I succeeded in procuring 2 new examples from the same locality. All of these specimens agree closely *inter se*, and, their total length ranging from 575mm to 622mm, they must be regarded as unusually large examples of the genus.

These individuals differing, I conceived, in several respects from *L. vahlii* as described by Reinhardt, a supposition still further confirmed by a direct comparison with one of the typical specimens, lent me for that purpose by Dr. Lütken, they were established as a new species, *L. esmarkii*, in the said treatise. Subsequently, however, before Dr. Lütken had completed his latest examination of the original specimens of *L. vahlii*, I was lead to regard these distinctive characteristics as comparatively unessential, and to include *L. esmarkii* in the list of synonyms, a view I continued to retain on one or two subsequent occasions, the last being that of the above-mentioned preliminary report of the North Atlantic Expedition.

One of the characters distinguishing *L. esmarkii* from *L. vahlii* was the colour — brownish-black, with a number of narrow, whitish transverse bands, some of which had patches of the dark ground-colour enclosed in the middle, or were broken up into annular spots, continuous below with the rings of the next transverse band[1].

It is in the highest degree probable, that the new individuals obtained on the North Atlantic Expedition represent immature stages of the form described as *L. esmarkii*. The resemblance between them is constant; in the same features that serve to distinguish the former from the typical *L. vahlii*, they agree with the type-specimens of *L. esmarkii*, though here and there some minor distinction may be observed, doubtless arising from the great difference in age and size. This applies, for instance, to the distribution of colour; the scaled surface, too, is of greater extent in the type-specimens of *L. esmarkii*, which, exclusive of isolated scales on the forehead, has also the nape fully scaled and the inner portion of the pectorals.

The final conclusion, therefore, is this, that the individuals from the North Atlantic Expedition, all of them comparatively young, are certainly identical with *L. esmarkii*

[1] The other character — derived from the scaling — which led me, when establishing the new species, to distinguish it from *L. vahlii*, is of minor importance; it must not however be passed by unnoticed, having in the original description given rise to misunderstanding. The scales in *L. esmarkii* were stated to extend as far as the snout, whereas *L. vahlii* had the head naked; this was incorrect, the closely set, almost circular impressions in the skin, resulting from its contraction, having been mistaken for scales. Not till the 5 individuals before me had been submitted to a close examination, did I succeed in detecting a few isolated true scales on the forehead, which had unquestionably developed in an advanced stage of growth.

der kjendte *L. esmarkii* fra Finmarken, og at de tilsammen udgjøre en fra den grønlandske *L. vahlii* forskjellig Art. Men med det forholdsvis ringe Materiale, der for Tiden staar til vor Raadighed, er det umuligt at komme til fuld Klarhed i dette, saavelsom i flere andre Spørgsmaale vedrørende denne Slægt.

Ved Godhed af Dr. Tarleton Bean og Prof. Spencer Baird har jeg efter Anmodning erholdt tilsendt et fuldt udvoxet Exemplar af den store *Lycodes*-Art, som erholdtes under U. S. Fish Commission udenfor Kysterne af Nova Scotia paa Nord-Americas Østkyst, og som i 1879 er opført som *L. vahlii* i Proc. U. S. Nat. Mus. vol. 2, p. 209. Dette Exemplar (Smiths. Inst. No. 24, 239), har en Længde af 645mm, en Hovedlængde af 152mm. Exemplaret er exviscereret, saa Kjønnet ikke kan bestemmes, men ifølge Hovedlængdens Forhold til Totallængden (4.04), synes Individet at have været en Han. Jeg har nøje sammenlignet dette Exemplar med de omtrent ligestore Typ-Exemplarer af *L. esmarkii* fra Finmarken, og finder dem i enhver Henseende overensstemmende. Farvetegningen er næsten fuldstændig den samme, alle Legemsproportioner ligeledes, og det samme er Tilfældet med det characteristiske Forhold mellem Tandrækken paa Palatinbenene og Mellemkjæven. Jeg nærer derfor ingen Tvivl ved at identificere begge, og Arten har herved faaet en interessant Udvidelse i sin geographiske Udbredelse.

Udmaalinger.	a. *Stat.* 124.	b. *Stat.* 363.	c. Han. *Stat.* 362.	d. Hun. *Stat.* 362.
Totallængde	81mm	114mm	265mm	295mm
Hovedets Længde	18,5 -	25 -	60 -	65 -
Overkjævens Længde	7 -	9 -	24 -	26 -
Legemets Højde over Begyndelsen af Dorsalen	8 -	13 -	34 -	44 -
Legemets Højde over Begyndelsen af Analen	7 -	11 -	30 -	37 -
Snudens Afstand fra Dorsalen .	21 -	29 -	70 -	80 -
Kroppens Længde (Snudespidsen til Anus)	31,5 -	45 -	105 -	160 -
Halens Længde (Anus til Halespidsen)	49,5 -	69 -	160 -	171 -
Snudens Afstand fra Øjet	6 -	8 -	18 -	21 -
Lindsens Diameter	2 -	3 -	6 -	7 -
Øjets Længde (Diameter af Iris)	5,5 -	6,5 -	11,5 -	12,5 -
Fra Lindsen til Gjællelaagets Spidse	10 -	14 -	34 -	36 -
Afstanden mellem Lindserne . .	3,5 -	4 -	10 -	13 -
Hovedets Højde över Øjnene . .	6,5 -	11 -	23 -	25 -
Hovedets Bredde over Kinderne .	8 -	14 -	30 -	33 -
Hovedets Højde umiddelbart bag Ventralerne	8 -	13 -	30 -	33 -
Afstanden fra Ventralerne til Anus	16 -	23 -	56 -	69 -
Pectoralens største Længde . .	11 -	17 -	36 -	40 -
Afstanden fra Pectoralspidsen til Anus	3 -	4 -	20 -	18 -

from Finmark, of which none but full-grown examples were previously known, and that both constitute a species distinct from the Greenland form *L. vahlii*. But with the materials at present before us, it is not possible to decide this question satisfactorily, as indeed is also the case with various other doubtful points connected with the genus *Lycodes*.

At my special request, Dr. Tarleton Bean and Professor Spencer Baird kindly sent me an example of the large species of *Lycodes*, taken on the cruize of the U. S. Fish Commission, off the coast of Nova Scotia, and which, in 1879, was referred to *L. vahlii* in Proc. U. S. Nat. Mus. vol. 2, p. 209. This specimen (Smith's Inst. No. 24, 239), has a length of 645mm; the length of the head is 152mm. Having been exviscerated, the sex cannot be determined; but judging from the proportion which the length of the head bears to the total length (4.04), the individual would appear to be a male. I have carefully compared this specimen with the typical specimens of *L. esmarkii*, about equal in size, from Finmark, and found the closest resemblance between them. The distribution of colour is almost exactly the same; the proportions of the body correspond, in like manner, as does also the characteristic relation subsisting between the series of teeth on the palatine bones, and those on the intermaxillary. Such being the case, no hesitation can be felt in identifying the two forms, which shows an interesting extension in the range of *L. esmarkii*.

Measurements.	a. *Stat.* 124.	b. *Stat.* 363.	c. Male. *Stat.* 362.	d. Fem. *Stat.* 362.
Total length	81mm	114mm	265mm	295mm
Length of head	18.5 -	25 -	60 -	65 -
Length of upper jaw	7 -	9 -	24 -	26 -
Depth of the body above origin of dorsal	8 -	13 -	34 -	44 -
Depth of the body above origin of anal	7 -	11 -	30 -	37 -
Distance of snout from dorsal . .	21 -	29 -	70 -	80 -
Length of the body proper (from point of snout to vent) . . .	31.5 -	45 -	105 -	160 -
Length of the tail (from vent to tip of tail)	49.5 -	69 -	160 -	171 -
Distance of snout from eye . .	6 -	8 -	18 -	21 -
Diameter of the lens	2 -	3 -	6 -	7 -
Length of the eye (diameter of iris)	5.5 -	6.5 -	11.5 -	12.5 -
Distance from the lens to the extremity of the opercle . . .	10 -	14 -	34 -	36 -
Distance between the lenses . .	3.5 -	4 -	10 -	13 -
Height of the head above the eyes	6.5 -	11 -	23 -	25 -
Breadth of head across the cheeks	8 -	14 -	30 -	33 -
Height of the head immediately posterior to the ventrals . .	8 -	13 -	30 -	33 -
Distance from ventrals to vent .	16 -	23 -	56 -	69 -
Greatest length of pectorals . .	11 -	17 -	36 -	40 -
Distance from extremity of pectorals to vent	3 -	4 -	20 -	18 -

Til Sammenligning vedføjes et Par Maal af de 5 fuldt udvoxede Individer fra Finmarken.

	A. (Skel.)	B. Han.	C. Hun (tørr.)	D. Han.	E. (tørr.)
Totallængde	575mm	582mm	595mm	610mm	622mm
Hovedets Længde	126 -	133 -	128 -	143 -	138 -
Overkjævens Længde	55 -	64 -	56 -	68 -	65 -
Legemets Højde	?	80 -	?	84 -	?
Kroppens Længde (Snuden til Anus)	220 -	226 -	255 -	242 -	250 -
Halens Længde (Anus til Halespidsen)	360 -	362 -	350 -	371 -	375 -

Beskrivelse. *Legemsbygning.* Nær beslægtet med *L. vahlii*, fra hvilken den, som ovenfor nævnt, er skilt ved sin (dog blot i yngre Alder tydeligt) dobbelte Sidelinie, de korte Kjæver, det altid forholdsvis store Hoved, den korte Ganetandrække, og Farven.

Legemet er af typisk *Lycodes*-Bygning; den største Højde indeholdes hos de ældre Individer omtrent 7—8 Gange i Totallængden, hos Ungerne 9, eller endog 10 Gange i denne, og Legemet bliver saaledes noget undersætsigere under Opvæxten.

Hovedet er forholdsvis stort, og har en høj og stump Snude, der er temmelig kort. Hovedet indeholdes fra $4^1/_4$ til noget over $4^1/_2$ Gange i Totallængden; hos intet af Individerne har Hovedlængdens Forhold til Totallængden været under 4,7, selv hos smaa Unger. Hos 2 udvoxede Han-Individer fra Finmarken er Forholdet 4,30 og 4,26; hos en ligeledes udvoxet Hun 4,64; sammenlignes 2 noget nær ligestore Individer af forskjelligt Kjøn, sees Hovedlængden hos den yngre Han fra Nordhavs-Expeditionen at indeholdes i Totallængden 4,41, hos den ligeledes yngre Hun 4,53, ligesom hos den fuldvoxne Han fra Finmarken 4,26, hos Hunnen 4,64, saaledes at Hannen, hvad der ogsaa var at vente, altid synes at have et større Hoved, end Hunnen.

Underkjæven er betydeligt kortere, end Overkjæven, og dette er allerede særdeles stærkt fremtrædende hos det mindste foreliggende Individ (med en Totallængde af blot 81mm).

Overkjæven er altid kortere, end den halve Hovedlængde, hvad der vil fremgaa af de ovenfor meddelte Udmaalinger, og naar tilbage under Midten, eller henimod Bagranden af Øjet. Sammenlignet med *L. vahlii* maa saaledes *L. esmarkii* siges at have et forholdsvis kort Ansigtsparti, skjønt Hovedet idethele er større.

De skaalformige Fordybninger langs Randen af Kjæverne, der ere characteristiske for denne Slægt, ere stærkest synlige hos Ungerne, hvor Hovedets Hud er tyndest; i Bunden sees her en tydelig og aaben Pore, men denne bliver svagere fremtrædende hos de ældre.

For comparison are subjoined a few measurements of the 5 full-grown individuals from Finmark.

	A. (Skel.)	B. Male.	C. Fem. (dried).	D. Male.	E. (dried).
Total length	575mm	582mm	595mm	610mm	622mm
Length of the head	126 -	133 -	128 -	143 -	138 -
Length of the upper jaw	55 -	64 -	56 -	68 -	65 -
Depth of the body	?	80 -	?	84 -	?
L. of the body (from snout to vent)	220 -	226 -	255 -	242 -	250 -
L. of the tail (from vent to tip of tail)	360 -	362 -	350 -	371 -	375 -

General Description. *Structure of the Body.* — Nearly related to *L. vahlii*, from which, as above stated, it is distinguished by a double lateral line (conspicuous however in young specimens only), the short jaws, the head, always comparatively large, the short series of palatine teeth, and the colour.

The body is of the typical *Lycodes* structure; its greatest depth equals, in mature individuals, from $^1/_7$ to $^1/_8$, in young examples, not more than $^1/_9$ or $^1/_{10}$ of the total length; hence the body increases in thickness with the growth of the fish.

The head is comparatively large, and terminates in an obtuse and elevated snout; the length of the head is contained from $4^1/_4$ to a trifle over $4^1/_2$ times in the total length; the proportion borne by the length of the head to the total length was in no case under 4.7, not even in the very young examples. In two full-grown males from Finmark, the proportion is as 1 to 4.30 and 4.26; in a full-grown female, as 1 to 4.64. If two individuals nearly equal in size, but of different sexes, be compared together, the length of the head in the young specimens obtained on the Expedition will be found to be 4.41 in the male, and 4.53 in the female; in the full-grown male from Finmark it is 4.26, in the female 4.64: hence the male, as was indeed to be expected, has invariably a larger head than the female.

The mandible is considerably shorter than the upper jaw, and this character shows very conspicuously even in the smallest of the specimens examined (total length only 81mm).

The upper jaw is invariably shorter than half the head, as appears from the measurements given above, extending back under the middle of the eye, or very nearly to its posterior margin. Compared with *L. vahlii*, *L. esmarkii* has the region of the face comparatively short, although the head itself is larger than in the former species.

The bowl-shaped depressions along the margin of the jaws are peculiar to this species; they are most conspicuous in the early stages of development, when the skin on the head is thinnest, terminating in a distinct and open pore; as the growth progresses, they gradually become less distinct.

Disse Porer føre oventil ind til den lange Række af de tynde Infraorbitalben, der ere forholdsvis store, og hvoraf hver danner en udad aaben Cavitet, der er begrændset af Benets nederste Del, samt af den øvre overbøjede Rand; den hele Række af disse Caviteter danne tilsammen en fælles slimafsondrende Canal. Paa Underkjæven føre Porerne ind til en lignende Canal, der løber ind i selve *maxilla inferior*, og som udad danner store rundagtige Aabninger i Lighed med de udad aabne Caviteter i Infraorbitalbenene; noget tilsvarende i Kjævernes Bygning finder Sted hos *Zoarces viviparus*, hvilket yderligere bidrager til at nærme disse 2 Slægter til hinanden.

Næseborene ere enkelte, rørformige, og sidde noget opløftede over Kjæveranden; deres indbyrdes Afstand er betydeligt mindre, end Pectoralens Grundlinie.

Øjnene ere aflange, med en tydelig tilspidset Øjekrog fortil og bagtil; de indeholdes hos middelsstore Exemplarer mellem 6 og 6½ Gange i Hovedlængden, men ere forholdsvis mindre hos de fuldt udvoxede, hvor de indeholdes 7—8 Gange i denne. Iøvrigt er Øjnenes rette Begrændsning vanskelig at drage, da denne viser sig forskjellig, eftersom Individerne ere bedre eller mindre vel vedligeholdte.

Gjællespalten er fuldkommen vertical, og forholdsvis trang; dens nedre Vinkel ligger omtrent lige foran Pectoralernes nederste Fæste. Gjællerne ere 4 i Antal; Pseudobranchier ere tilstede. Gjællestraalernes Antal er 6.

Tænderne, der ere tilstede i Mellem- og Underkjæven, paa Palatinbenene, og paa Vomer, som hos alle typiske Lycoder, ere forholdsvis lange og stærke, svagt krummede, samt noget cylindriske. Det er characteristisk for *L. esmarkii*, sammenlignet med *L. vahlii*, at Tandrækken paa Palatinbenene aldrig er længere, end Rækken i Mellemkjæven, men oftest (især hos udvoxede Individer) betydeligt kortere, lige indtil neppe Halvdelen af denne. Saaledes er den absolute Længde af de nævnte 2 Tandrækker hos de 2 største af Nordhavs-Expeditionens Individer, samt af de foreliggende 5, fuldt udvoxede Individer fra Finmarken, følgende:

		Totallængde.	Længden af Tandrækken	
			paa Palatinbenene.	paa Mellemkjæverne.
c. *Stat.* 362.	Ung Han . .	265mm	10—11mm	11—11mm
d. *Stat.* 362.	Ung Hun . .	295 -	10—11 -	11—11 -
A. Finmarken.	(Skelet) . .	575 -	15—16 -	26—27 -
B. —	Gl. Han. .	582 -	16—18 -	27—28 -
C. —	Gl. Hun .	595 -	14—16 -	26—26 -
D. —	Gl. Han. .	610 -	17—17 -	30—31 -
E. —	(tørret) . .	622 -	12—13 -	32—34 -

Hos de fuldvoxne Individer danne Tænderne i Mellemkjæven bagtil en enkelt, fortil en 3dobbelt Række, hvori de yderste Tænder ere de længste. Underkjævens Tænder danne fortil 3—4 uregelmæssige Rækker, bagtil en dobbelt Række, der gaar betydeligt længere tilbage, end den tilsvarende i Overkjæven, og Tænderne i denne Kjæve corre-

Above, these pores extend inwards to the thin infraorbital bones, which are comparatively large, forming each a cavity, open exteriorly, which is bounded by the inferior portion of the bone and the superior overlapping margin; these cavities constitute together a mucous canal. On the mandible, too, the pores terminate in a secretory canal, which is produced interiorly into the *maxilla inferior*, and constitues a series of large circular openings similar to the cavities, open exteriorly, in the infraorbital bones. To this peculiarity of structure the jaws in *Zoarces viviparus* present analogous features, a circumstance tending still further to increase the resemblance between the two genera.

The nostrils are single, tubular, and situated slightly above the margin of the jaw; their distance from each other measures much less than the base of the pectorals.

Eyes ovate, distinctly angular anteriorly and posteriorly; their diameter, in examples of moderate size, is to the length of the head as 1 to 6—6½; in full-grown individuals they are proportionately smaller — as 1 to 7—8. For the rest, the limits of the eyes are difficult to determine, varying as they do with the state of preservation of the specimens.

The gill-opening a strictly vertical slit, and comparatively narrow; its inferior angle almost immediately in front of the lowest extremity of the pectorals. Gills 4; pseudobranchiæ present; branchiostegals 6.

Teeth, as in all typical *Lycodes*, on the inter and inferior maxillaries, the palatine bones, and the vomer; they are comparatively long and powerful, slightly curved and cylindrical. A characteristic feature of *L. esmarkii*, as compared with *L. vahlii*, is the length of the dental series on the palatine bones, which is never greater than that of the series on the inter-maxillary, but as a rule (more especially in full-grown examples) considerably less, sometimes by as much as one-half. Thus, for instance, the two series in the two largest of the specimens taken on the North Atlantic Expedition, and in the five full-grown examples from Finmark, measured respectively as follows: —

		Total L.	Length of Dental Series	
			On Palatine bones.	On Inter-maxillaries.
c. *Stat.* 362.	Young Male .	265mm	10—11mm	11—11mm
d. *Stat.* 362.	Young Female	295 -	10—11 -	11—11 -
A. Finmark.	(Skeleton) . .	575 -	15—16 -	26—27 -
B. —	Old Male . .	582 -	16—18 -	27—28 -
C. —	Old Female .	595 -	14—16 -	26—26 -
D. —	Old Male . .	610 -	17—17 -	30—31 -
E. —	(dried specm.)	622 -	12—13 -	32—34 -

In adults, the teeth constitute on the inter-maxillary posteriorly a single, anteriorly a triple series, the exterior teeth being the longest. The teeth in the mandible constitute anteriorly 3—4 irregular series, posteriorly a double row, which extends considerably farther back than that corresponding with it in the upper jaw; indeed the man-

spondere nærmest med Palatinbenenes. I den yderste Række ere de rettede skjævt udad, eller ligge tildels næsten horizontalt. Paa Palatinbenene findes paa hver Side 9—11 Tænder samlede i en enkelt, eller undertiden i en dobbelt Række. Endelig findes en Samling Tænder (af samme Størrelse, som de øvrige) paa Vomer.

Hos yngre Individer ere Tænderne noget færre, og Rækkerne fortil blive først efterhaanden fuldtallige.

Kjæverne ere, som hos alle Lycoder, dækkede af en tyk, fedtholdig Hud, der paa Underkjæven danner en nedhængende, noget aflang Flig.

Anus ligger i en Afstand fra Snudespidsen, der indeholdes omtrent $2^1/_2$ Gange i Totallængden.

Af Totallængden udgjør	a. Totall. 81^{mm}	b. Totall. 114^{mm}	c. Han. Totall. 265^{mm}	d. Hun. Totall. 295^{mm}
Hovedets Længde	4,37	4,58	4,41	4,53
Legemets Højde	10,12	8,76	7,79	7,02
Snudens Afstand fra Dorsalen	3,68	3,93	3,78	3,68
Kroppen (Snuden til Anus)	2,57	2,53	2,52	2,37
Halen (Anus til Halespidsen)	1,64	1,65	1,65	1,72

Til Sammenligning vedføjes endel Forholde, der kunne udledes af de 5 foreliggende større Individer fra Finmarken, hvoraf 2 opbevares i tørret Tilstand, 1 som Skelet.

Af Totall. udgjør	A. (Skelet.) Totall. 575^{mm}	B. Han. Totall. 582^{mm}	C. Hun (tørret). Totall. 595^{mm}	D. Han. Totall. 610^{mm}	E. (tørret). Totall. 622^{mm}
Hovedets Længde	4,56	4,37	4,64	4,26	4,52
Legemets Højde	?	7,27	?	7,26	?
Kroppen (Snuden til Anus)	2,61	2,57	2,33	2,52	2,48
Halen (Anus til Halespidsen)	1,59	1,60	1,70	1,62	1,65

Ovarierne og *Testes* ere enkelte. Af Expeditionens Individer var det ene (hvis Totallængde var 265^{mm}) en ung Han, med endnu ikke fuldt udviklede Testes, det noget større Individ (Totallængde 295^{mm}) en Hun, med fuldmodne Æg i det eneste Ovarium. Disse Æg vare forholdsvis store, neppe over 300 i Antal, alle jevnt udviklede; desuden fandtes et mindre Antal, der tilsyneladende ikke vilde have udviklet sig. Ovariet var enkelt.

Af de store Exemplarer fra Finmarken er det ene, der har været tørret, en Hun, idet der endnu vedhænger Dele af Ovariet med (ufuldbaarne) Æg. Dette viser, at Hunnen saaledes kan opnaa en lignende betydelig Størrelse, som Hannen. Af de øvrige vare de 2 velbevarede Individer Hanner, med udviklede Testes. Den venstre af disse var saa kort, at den næsten kan kaldes rudimentær (14—17^{mm}), den højre lang (70^{mm}).

Appendices pyloricae mangle.

dibular teeth correspond rather with those on the palatine bones. In the exterior series they incline obliquely outwards, or are some of them almost horizontal. The palatine bones are furnished on each side with 9—11 teeth in a single, sometimes a double row. Finally, a patch of teeth occurs on the vomer.

Young individuals have somewhat fewer teeth, and the full number of the anterior series is attained gradually.

As in all the *Lycodes*, the jaws are protected by a thick adipous skin, depending from the mandible in the form of an oval lappet.

The distance from the vent to the point of the snout is to the total length about as 1 to $2^1/_2$.

The Total Length contains	a. Total L. 81^{mm}	b. Total L. 114^{mm}	c. Male. Total L. 265^{mm}	d. Female. Total L. 295^{mm}
Length of the head	4.37	4.58	4.41	4.53
Depth of the body	10.12	8.76	7.79	7.02
Distance of snout from dorsal	3.68	3.93	3.78	3.68
Body (from snout to vent)	2.57	2.53	2.52	2.37
Tail (from vent to tip of tail)	1.64	1.65	1.65	1.72

For comparison are subjoined a few proportions deduced from measurements of the 5 large Finmark specimens, 2 dried, and 1 a skeleton.

The Total Length cont.	A. (Skel). Total L. 575^{mm}	B. Male. Total L. 582^{mm}	C. Fem. (dried). Total L. 595^{mm}	D. Male. Total L. 610^{mm}	E. (dried). Total L. 622^{mm}
Length of the head	4.56	4.37	4.64	4.26	4.52
Depth of the body	?	7.27	?	7.26	?
Body (from snout to vent)	2.61	2.57	2.33	2.52	2.48
Tail (from vent to tip of tail)	1.59	1.60	1.70	1.62	1.65

Ovaries and *testes* single. Of the two largest individuals obtained on the Expedition, one (total length 265^{mm}) was a young male, with the testes not fully developed, the other, of somewhat larger size (total length 295^{mm}), a female, with mature ova in the single ovary. These ova, hardly more than 300 in number, were comparatively large, all of them uniformly developed, exclusive of which was a smaller number that in all probability would not have arrived at maturity. The ovary was single.

Of the large specimens from Finmark, one, which had been dried, was a female, portions of the ovary, with (immature) ova, being still attached to the abdomen. This shows that females can attain as large a size as males; of the remaining examples, the 2 well preserved specimens were males, with well developed testes. That on the left side is so short as to be almost rudimentary (14—17^{mm}), that on the right is long (70^{mm}).

No pyloric appendages.

Finnerne. Straaleantallet hos de 4 under Expeditionen erholdte yngre Individer var følgende (Caudalen indbefattet i Dorsalen og Analen):

	a.	b.	c.	d.
Dorsalen (+ 1/2 Caudal)	103	103	103	102
Analen (+ 1/2 Caudal)	88	91	92	90
Pectoralerne	20—21	22—23	22—23	21—22

Hos de store Individer fra Finmarken lod Straaleantallet sig kun hos de 2 med nogenlunde Sikkerhed tælle, og dette viste sig at være følgende:

	A.	C.
Dorsalen (+ 1/2 Caudal)	118	113
Analen (+ 1/2 Caudal)	102	97
Pectoralerne.	23—23	23—23

At Straaleantallet hos disse fuldt udvoxede Individer er større, end hos de yngre, maa forklares paa den Maade, at der har vedblevet at afsætte sig Hvirvler med tilhørende Straaler under hele Opvæxten.

Dorsalen, som udspringer i en Afstand fra Nakken, der er omtrent lig en halv Pectorallængde, indeholder saaledes 102 til 103, eller hos særdeles gamle Individer lige til 118 Straaler, om den halve Caudal (6 Straaler) medregnes. Dorsalstraalerne ere alle kløvede indtil Grunden, og fra Midten af fint articulerede; hos de længste Straaler (paa Midten af Halepartiet) er ligeledes hver Halvdel atter kløvet. Den hele Finne er, ligesom Analen, indhyllet i en tyk og fedtholdig Hud, der meget ligner den, der findes hos *Anarrhichas*-Arterne.

Analen tiltager, ligesom Dorsalen, i Straaleantal med Alderen, og har hos yngre 88—92, hos fuldt udvoxede indtil 102 Straaler, Caudalens nedre Halvdel (5 Straaler) iberegnet. Den er iøvrigt bygget ligesom Dorsalen, og en Dobbeltkløvning finder ogsaa her Sted hos de længste Straaler.

Caudalen har sandsynligvis hos alle Lycoder den samme Bygning, og er dannet af et øvre Straaleknippe, bestaaende af 6, et nedre af 5 Straaler, alle korte, spinkle og særdeles tætstaaende, saa at de kun med Vanskelighed lade sig tælle.

Pectoralerne tælle 20 til 23 Straaler, og Tallet er ofte ulige paa hver Side hos samme Individ. De ere forholdsvis længst hos yngre Individer; hos den mindste foreliggende Unge (hvis Totallængde er 81 mm) indeholdes de 6,7 Gange i Totallængden, hos et fuldt udvoxet omtrent 8,5 Gange i denne.

Fremdeles undergaar denne Finne en Forandring i sin Form under Opvæxten, hvortil jeg ikke har seet noget tilsvarende hos de øvrige Arter. Hos alle yngre ere de 6 nederste Straaler noget forlængede, saaledes at de rage kjendeligt frem forbi de mellemste Straaler; derved bliver Finnens Rand tydeligt indskaaret. Hos de ældre Individer ere derimod de nedre Straaler gradvis forkortede, og et-

Fins. — The number of rays, inclusive of caudal, in the 4 young individuals obtained on the Expedition was as follows: —

	a.	b.	c.	d.
Dorsal (+ 1/2 caudal)	103	103	103	102
Anal (+ 1/2 caudal)	88	91	92	90
Pectorals	20—21	22—23	22—23	21—22

In 2 only of the large individuals from Finmark could the number of fin-rays be determined with comparative accuracy; the formula was as follows: —

	A.	C.
Dorsal (+ 1/2 caudal)	118	113
Anal (+ 1/2 caudal)	102	97
Pectorals	23—23	23—23

The fact of the rays in these full-grown examples having been more numerous than in the young individuals may be explained by assuming vertebræ to have successively developed along with the rays throughout the whole period of growth.

The dorsal, commencing at a distance from the nape about equal to half the length of the pectorals, contains from 102 to 103, or, in very old examples, as many as 118 rays, including half of the caudal (6 rays). The dorsal rays are all cleft to the base, and from the middle finely articulated; moreover, in the longest rays (middle of caudal region) each half is cleft. As with the anal, the whole fin is enveloped in a thick adipous skin, closely resembling that observed in the genus *Anarrhichas*.

As in the dorsal, the number of rays in the anal increases with the growth, being in young examples 88—92, and in adults reaching 102, inclusive of the lower half of the caudal (5 rays). The structure of the anal is similar to that of the dorsal; the longest rays of this fin, too, are double-cleft.

The structure of the caudal is probably the same in all the *Lycodes*; there is an upper fascicle of rays, consisting of 6, and a lower one, consisting of 5 rays, all short, slender, and exceedingly close, which renders it a matter of no little difficulty to count them.

The pectorals are furnished with from 20 to 23 rays, and the number is not infrequently different on each side in the same individual. They are relatively longest in young examples; in the smallest of the young specimens (total length 81 mm), their length is to the total length as 1 to 6.7; in an adult, nearly as 1 to 8.5.

This fin undergoes, too, a change in its form during the period of growth, to which I have observed nothing analogous in any of the other species. All young individuals have the 6 lowest rays somewhat elongated, causing them to project perceptibly past the middle rays, which gives to the margin of the fin a notched appearance. In more mature examples, the inferior rays gradually decrease

nvert Spor af denne Ejendommelighed forsvundet. Disse nedre Straaler ere beklædte med en tykkere Hud, end de øvrige, samt have fri Spidser, et tydeligt Bevis paa, at de tjene Dyret til Krybe- eller Føleorgan. Straalerne ere delte til Grunden, og ere i Spidserne, der ere fint articulerede, i Regelen tvedelte. Naar Pectoralerne bøjes fremover, naa de til Lindsens Forrand eller hos enkelte til dens Midte.

Ventralerne ere korte, og indeholde 1 enkelt og yderst spinkel Straale, samt derefter 3 noget tykkere, der ere kløvede til Grunden. De ere samtlige indhyllede i en tyk Hud, og lade sig blot ved Dissection tælle; den første udelte Straale har blot de øvriges halve Længde, og er yderst let at overse. Alle ere leddede.

Hvirvlernes Antal var hos det ovennævnte Skelet af et udvoxet Individ fra Finmarken 23 + 95, saaledes tilsammen 118.

Skjælbeklædning. Som hos alle Lycoder synes Skjælbeklædningen at udbrede sig videre over Legemet under Individets hele Væxt, og er saaledes mindst udbredt hos Ungerne, endskjønt Forskjellen er forholdsvis ikke stor. Hos Expeditionens 2 største Individer (Totallængden 265—295^{mm}) er Skjælbeklædningen udbredt til et Stykke foran Begyndelsen af Dorsalen, og paa Bugen hen til Ventralerne; ligeledes er saavel Dorsalen som Analen skjælbeklædte lige ud imod Randen, eller i omtrent $^3/_4$ af Finnernes Højde. Derimod er Hovedet og Nakken nøgne, ligesom Pectoralerne og Ventralerne.

Hos de fuldt udvoxede Exemplarer fra Finmarken, hvor Totall. er 500^{mm} eller derover, strækker Skjælbeklædningen sig frem over Nakken, hvorimod Hovedet regulært synes at være nøgent; blot efter den omhyggeligste Undersøgelse har det været mig muligt at opdage enkelte spredte Skjæl paa Siderne af Panden, og disse synes ikke engang at være tilstede hos alle Individer. Dorsalen og Analen er tæt skjælbeklædte lige ud til deres yderste Rande, og Skjællene gaa paa Halen lige ud til Caudalens Spidse. Fremdeles ere Pectoralerne, der hidtil have været nøgne, skjælbeklædte paa sin indre Trediedel.

Hos de 2 Unger fra Expeditionen er Skjælbeklædningen i det hovedsagelige allerede fremkommen i sin Helhed paa Legemet; hos det største Individ (*b*, Totall. 114^{mm}) ere Finnerne, saavelsom Grunden langs disse, endnu nøgne; hos det mindste (*a*, Totall. 81^{mm}) er Skjælbeklædningen paa hele Halepartiet endnu sparsom, og blot i sit Frembrud.

Skjællene ere runde eller noget elliptiske, og ligge nedsænkede i Huden med saa stort Mellemrum, at deres Rande ikke berøre hinanden. Paa Bugen staa Skjællene mest spredte, paa Halen tættest. De Skjæl, der beklæde Finnerne, ere mindre, end Legemets. Skjællene ere beklædte af en yderst fin, noget mørkfarvet Hud.

Sidelinien er hos denne Art dobbelt, og hos vel conserverede Exemplarer af Middelstørrelse ret tydelig. Den udspringer enkelt ved Gjællespaltens øvre Ende, gjør en liden skarp Bue over Gjællelaagets Flig, deler sig derpaa kort bagenfor denne i 2 Grene, hvoraf den øvre, medio-laterale, der er den tydeligste, løber langs hele Legemets

in length till every trace of this peculiarity has disappeared. These inferior rays are enveloped in a thicker skin than the rest, and have free points, a sure sign that they serve the animal as a means of creeping or as an organ of sensation. The rays are cleft to the base, and, at the points, which are finely articulated, as a rule double-cleft. If pressed forwards, the pectorals extend to the anterior margin or to the middle of the lens.

The ventrals are short, and consist of one exceedingly slender ray and 3 somewhat thicker rays, cleft to the base. They are all enveloped in a thick skin, dissection being necessary in order to count them; the first simple ray is only half as long as the others, and may be easily overlooked; they are all articulated.

The number of vertebræ in the above-mentioned skeleton of a full-grown example from Finmark was 23 + 95 = 118.

Scales. — As in all *Lycodes*, the scaled integument continues, it would seem, to spread over the body during the entire period of growth; and hence it covers a smaller surface in young specimens, though the absolute difference is comparatively but slight. In the 2 largest examples taken on the Expedition (total length respectively 265^{mm} and 295^{mm}), the scaling extends almost to the origin of the dorsal, and on the belly as far as the ventrals; both the dorsal and anal, too, are scaled nearly to the margin, or about three quarters of the height of the fin. The head and nape, however, are naked, as also the pectorals and the ventrals.

In the full-grown specimens from Finmark (total length exceeding 500^{mm}), the scaled integument extends forwards over the nape, the head being apparently as a rule naked; not till after a most careful examination did I succeed in detecting a few isolated scales on the sides of the forehead, and even these would seem not to occur in all individuals. The dorsal and anal are densely scaled to their extreme margin, and on the tail the scales extend to the tip of the caudal. The pectorals, too, previously naked, are now scaled on their inner third.

In the 2 young specimens taken on the Expedition, the scaled integument is for the most part fully developed on the body; in the largest individual (*b*, total length 114^{mm}), both the fins and the skin along their base are still naked; in the smallest (*a*, total length 81^{mm}), the scales on the tail are just beginning to develop.

The scales are round or slightly elliptic, and lie embedded in the skin, the space between them being just sufficient to prevent contact. On the belly, the scales are most distant, densest on the tail. The scales covering the fins are smaller than those on the body; all are invested with an exceedingly thin, darkish membrane.

Lateral Line. — The lateral line in this species is double, and in well preserved specimens of moderate size distinctly perceptible. It originates single on the upper extremity of the branchial opening, makes a sharp bend above the flap of the gill-cover, and then divides a short distance posterior to the latter into two branches, the su-

Midtlinie lige ud til Caudalen. Den nedre Gren, den ventrale, løber skraat nedad mod Analen, og naar dennes Grund omtrent ved den 16de Straale, hvorefter den følger langs denne Finne henimod Caudalen. Paa Stykket fra Gjællespalten til det Sted, hvor den øvre (mediolaterale) Linie naar Legemets Midtlinie (hvilket finder Sted omtrent ved Pectoralens indre Trediedel), findes omtrent 24 Porer, idet de paa dette Stykke ere særdeles tætstaaende; paa det næste Stykke indtil Perpendiculæren over Anus staa omtrent 14 Porer.

Hos de fuldt udvoxede Individer fra Finmarken, der længe have været opbevarede paa Spiritus, ere Sidelinierne idethele lidet synlige, og kunne blot efter omhyggelig Undersøgelse paavises, men ere dog ikke ganske forsvundne. Den mediolaterale er dog undertiden neppe til at paavise, og synes saaledes under Opvæxten efterhaanden ganske at forsvinde.

Hos den mindste Unge (*a*, Totall. 81^{mm}) ere begge Linier endnu utydelige, men allerede synlige hos den større Unge (*b*, Totallængde 114^{mm}).

Farven. Denne er hos alle Expeditionens Individer, ogsaa hos de smaa Unger, dyb brunsort med smale, skarpt-begrændsede, hvidgule Baand, hvis Antal varierer fra 5—8, løbende verticalt nedad Legemet. Desuden findes, som Antydning til et yderligere Baand, en hvidgul Plet paa hver Side af Nakken, umiddelbart over Gjællespalten. Bugsiden er ubetydeligt lysere.

Af Tverbaandene begynder det første noget bagenfor Begyndelsen af Dorsalen; det sidste kan bedække Halespidsen, eller ligge kort foran denne. De stige alle fra Dorsalens yderste Rand ret nedover Legemet; de bagre gaa lige ud over Analen, de forreste naa blot til, eller noget over Midtlinien. Baandenes Bredde er omtrent lig en Lindsediameter; deres Farve er hvidgul, og da de ere temmelig skarpt begrændsede, staa de særdeles tydeligt mod den sorte Bundfarve. Hovedet er graabrunt, med mørkere Skygning paa Gjællelaagets Flig; Skjællene ere noget lysere, end Bundfarven, og have paa de Partier af Legemet, hvor de lyse Tverbaand findes, ligeledes disses hvidgule Farve.

Den ovenfor beskrevne Farvetegning tilkommer sandsynligvis alle Individer, hvis Totallængde ikke overskrider 400^{mm}, eller der omkring, ligesom den allerede findes hos Ungerne, naar disse have naaet en Totall. af 80^{mm} (den spæde Yngel af denne Art er endnu ukjendt). Hos Expeditionens 2 Unger er imidlertid Nakkepletten endnu ikke fremkommen; men Baandene, hvis Antal hos begge er 8, ere alle tydeligt ansatte.

Derimod har Farven hos de fuldt udvoxede (Finmarkske) Individer, som det vil sees af den medfølgende Figur, undergaaet en ret mærkelig Forandring, der synes at være constant, da den (blot med visse uvæsentlige Variationer) har optraadt hos alle de hidtil paaviste 5 Individer.

perior, mediolateral branch, which is the most distinct, running parallel to the mesial line of the body, and passing straight to the caudal. The inferior, ventral branch descends obliquely towards the anal, reaching the base of that fin at about the 16th ray, after which it accompanies the latter to the caudal. In the portion extending from the branchial opening to the point at which the mediolateral branch reaches the mesial line of the body (about at the inner third of the pectoral) there are about 24 pores, their arrangement here being exceedingly close; the succeeding portion, reaching to a point perpendicular to the vent, has 14 pores.

In the full-grown specimens from Finmark, preserved a long time in spirits, the lateral lines are far less distinct, nay very considerable difficulty is experienced in tracing them; but they are not wholly obliterated. In some individuals the mediolateral branch can hardly be distinguished, and would seem therefore to disappear altogether during the progress of growth.

In the smallest of the immature examples (*a*, total length 81^{mm}), both branches are as yet indistinct, but already perceptible in the largest (*b*, total length 114^{mm}).

Colour. — In all the specimens taken on the Expedition, including the immature examples, the colour is a deep brownish-black, with narrow, clearly defined whitish-yellow bands, from 5 to 8 in number, extending vertically down the body. Exclusive of these, there is a rudimentary indication of another band, in the shape of a whitish-yellow patch on either side of the nape, immediately above the branchial opening. The ventral surface is a trifle lighter.

The first of the transverse bands commences a little posterior to the origin of the dorsal; the terminal band sometimes covers the tip of the tail, or, if not, extends in close proximity to it. They descend all of them from the margin of the dorsal straight down the sides of the body; the posterior bands extend across the anal, the anterior ones reaching only as far as, or a short distance above, the mesial line. The width of these bands is about equal to the diameter of the lens; they are whitish-yellow in colour, and being rather sharply defined form a strong contrast to the black ground-colour. The head is greyish-brown, with a darker clouding on the flap of the gill-cover; the scales are a trifle lighter than the ground-colour, sometimes of the same colour as the transverse bands.

The coloration described above is probably common to all individuals with a total length not exceeding 400^{mm}, or thereabouts; it is characteristic, too, of young examples which have attained a total length of 80^{mm} (the fry of this species is as yet unknown). In the two young specimens taken on the Expedition, the nuchal patch, however, has not yet developed, but the bands, numbering 8, are all of them distinctly obvious.

On the other hand, the colour in the full-grown (Finmark) specimens, as will be seen from the accompanying figure, has undergone a remarkable change, which would appear to be constant, seeing that it characterises (with but few and immaterial variations) each of the 5 indi-

Hos disse ere de verticale hvidgule Tverbaand i sin Midte opfyldte af den sorte Bundfarve, eller tildels oploste til hvidagtige, aflange Ringe; Baandenes Antal og Beliggenhed er den samme, som hos Expeditionens Exemplarer, men undertiden kunne de være indbyrdes forenede nedtil, og danne her sammenhængende, guirlandeformige Tegninger. Deres Begrændsning er mindre skarp, end hos de yngre Individer. Hos et af Individerne ere de paa det egentlige Legeme ganske utydelige, men endnu paa Dorsalerne skarpt begrændsede; hos dette er saaledes Legemet næsten ensfarvet mørkt brunsort. Nakkepletterne kunne være sammenhængende, og danne et tversover Nakken løbende distinct Baand.

Føde. I Ventrikelen af det største af Expeditionens Individer, en Hun (fra 459 Favnes Dyb), fandt jeg Røret af en Annelide, maaske af en *Terebella*, fremdeles adskillige Individer af *Themisto libellula*, Mandt, samt endelig en Del Grus fra Bunden, hvoriblandt saaes mange smukke Foraminiferer, især af en af de *Nautilus*-lignende Slægter (*Rotalina?*). Hos det noget mindre Han-Individ fra samme Localitet og Dybde fandtes blot Levninger af *Themisto libellula*.

Hos 2 gamle Hanner fra Finmarken, optagne paa et Par hundrede Favnes Dyb i Varangerfjorden, har jeg fundet alene knuste Echinodermer, hvoriblandt kunde kjendes *Ctenodiscus crispatus*, (Retz.), *Ophiacantha spinulosa*, Müll. & Tr., samt *Antedon sarsii* (Düb. & Kor.). Endskjønt disse Individer saaledes vare henviste til denne kalkholdige Føde, vare deres Tænder dog ikke synderlig slidte.

Udbredelse. *L. esmarkii* foreligger allerede saavel fra den europæiske, som fra den americanske Side af Atlanterhavet. Af Expeditionens Individer erholdtes de 3 i Trakterne af Spitsbergen i 1878, det ene i faa Miles Afstand fra denne Øgruppes Nordvestkant. Det 4de, en spæd Unge, optoges fra Bankerne udenfor Helgeland i Norge i 1877. Endelig foreligge 5 fuldt udvoxede Individer fra Fjordene i Finmarken, erholdte i Aarene 1864—76; de 4 ere fangede paa Dybsagn (Line) i Varangerfjorden i Østfinmarken, hvor jeg ligeledes har erfaret, at andre (ikke opbevarede) Individer i de sidste Aar have været erholdte; det sidste erholdtes i Øxfjord søndenfor Hammerfest (Vest-Finmarken).

Som tidligere bemærket, henhøre ligeledes de under Navn af *L. vahlii* foreløbig opførte Individer fra Nord-Americas Østkyst under forhaandenværende Art. Paa den sidstnævnte Localitet erholdtes i Aarene 1878—79 4 fuldvoxne Individer udenfor Kysterne af Nova Scotia, hvor dog Havfaunaen endnu er ganske arctisk. Det ene af disse opbevares paa Univ. Mus. i Christiania.

viduals. In these specimens, the middle portion of the vertical whitish-yellow transverse bands is filled up with the black ground-colour, or broken up into whitish elliptic rings; the number of these bands and their position is the same as in the specimens taken on the Expedition; sometimes, however, they are united together and form continuous chaplet-shaped markings; they are less sharply defined than in the younger examples. In one of the individuals they are quite indistinct on the body, but continue to be sharply defined on the dorsals; this specimen, therefore, has the body of an almost uniform brownish-black. The nuchal patches are sometimes continuous, forming a transverse band across the nape.

Food. — In the ventricle of the largest specimen taken on the Expedition, a female (brought up from a depth of 459 fathoms), I found the house of an Annelid, possibly a *Terebella*, several examples of *Themisto libellula*, and a quantity of gravel from the bottom, in which were many fine *Foraminiferæ*, belonging chiefly to one of the Nautilus-like genera (*Rotalina?*). The stomach of the male, a somewhat smaller individual, from the same locality, contained only fragments of *Themisto libellula*.

In the ventricles of two old males from Finmark, taken at a depth of a couple of hundred fathoms, in the Varanger Fjord, I found only crushed *Echinodermata*, amongst which could be determined *Ctenodiscus crispatus*, (Retz.), *Ophiacantha spinulosa*, Müll. & Tr., and *Antedon sarsii* (Düb. & Kor.). Although the individuals in question had subsisted on this calcareous food, their teeth were but little worn.

Distribution. — *L. esmarkii* has been met with both in the European and the American tracts of the North Atlantic. Three of the specimens of *L. esmarkii* collected on the Expedition were taken in the tract adjacent to Spitzbergen, in 1878, one of them but a few miles from the north-western extremity of that group of islands; the fourth, a very young individual, was taken on the banks off Helgeland, in Norway, in 1877. Finally, 5 full-grown specimens were obtained from the fjords of Finmark, in the period from 1864 to 1876, 4 of them from the Varanger Fjord, in East Finmark, where, as I am given to understand, other individuals, not preserved, have been taken of late years, that last obtained having been captured in the Øxfjord, south of Hammerfest (West Finmark).

As already observed, the specimens from the eastern coast of North America, provisionally referred to *L. vahlii*, belong likewise to the present species. In that region were obtained in the years 1878 and 1879 four full-grown examples off the coasts of Nova Scotia, where the marine fauna has quite an Arctic character. One of the specimens is preserved in the University Museum, Christiania.

19. **Lycodes frigidus**, Coll. 1878 (n. sp.).

Pl. III. Fig. 23—24.

Lycodes vahlii, pt. Coll. (nec Reinh.) Forh. Vid. Selsk. Chra. 1878, No. 4, p. 11 (1878).
Lycodes frigidus, Coll. Forh. Vid. Selsk. Chra. 1878, No. 14, p. 45 (1878).

Diagn. *Farven ensartet rødligt graabrun, uden Baand eller Pletter. Skjællene beklæde hele Legemet indtil Hovedet, samt hos fuldt udvoxede tillige Grunden af Dorsalen og Analen; hos de yngre er oftest Bugen i Midten, Finnerne, samt Grunden langs disse nøgne. Legemets Højde indeholdes $6^1/_2$, hos de yngre indtil $9^1/_2$ Gange i Totall. Hovedet er fladtrykt, og indeholdes i Totallængden 4 til $4^1/_2$ Gange. Sidelinien enkelt, ventral. Pandens Bredde indeholdes 20 Gange i Hovedets Længde. Appendices pyloricae mangle. Størrelsen indtil 510^{mm} (og derover).*

M. B. 6. D. + $^1/_2$ C. 99—104; A. + $^1/_2$ C. 85—90; P. 20—21.

Localit. fra Nordh. Exped. 15 Individer, de fleste halvvoxne, 1 sandsynligvis fuldt udvoxet, optoges fra Havet omkring Beeren Eiland og Spitsbergen; 2 (Yngel-)Individer optoges fra Bankerne udenfor Helgeland og Lofoten i Norge.

	Stat. 124.	*Stat.* 164.	*Stat.* 295.	*Stat.* 303.	*Stat.* 312.	*Stat.* 353.	*Stat.* 363.
Beliggenhed.	325 Kil. V. Bodø.	117 Kil. V. Lofoten.	458 Kil. V. Hammerfest.	450 Kil. V. Beeren Eil.	108 Kil. V. Beeren Eil.	230 Kil. V. Isfj., Spitsb.	60 Kil. V. Norskø. Spitsb.
Dybde.	350 Favne (640^m).	457 Favne (836^m).	1110 Favne (2030^m).	1200 Favne (2195^m).	658 Favne (1203^m).	1333 Favne (2438^m).	260 Favne (475^m).
Temp. p. Bunden.	— 0,9° C.	— 0,7° C.	— 1,3° C.	— 1,6° C.	— 1,2° C.	— 1,4° C.	+ 1,1° C.
Bunden.	Ler.	Graat Sandler.	Biloculina-Ler.	Brunt Ler.	Brunt og grønt Ler.	Biloculina-Ler og Sten.	Blaaler.
Datum.	19de Juni 1877.	29de Juni 1877.	14de Juli 1878.	19de Juli 1878.	22de Juli 1878.	10de Aug. 1878.	14de Aug. 1878.
Antal Individ.	1 Yngel-Indiv.	1 Yngel-Indiv.	5 Indiv. (udvox.)	1 Indiv.	5 unge Indiv.	3 Indiv.	1 Indiv.

Bemærkninger til Synonymien. Da jeg i Februar 1878 (Forh. Vid. Selsk. Chra. No. 4) afgav den foreløbige Beretning om de under de 2 første af Expeditionens Togter indsamlede Fiske (1876—77), forelaa et Par Yngel-Individer af en *Lycodes*, som henførtes under *L. vahlii*, uagtet de ikke udviste Spor af de for denne Art characteristiske Tverbaand. Tilværelsen af en stor, skjælbeklædt, og i alle Aldre ensfarvet *Lycodes* var dengang endnu ukjendt. De nævnte 2 Yngel-Individer omtaltes derfor og beskreves (sammen med en samtidig erholdt Unge af *L. esmarkii*) som *L. vahlii*, da der i Legemsbygning og Straaleantal forekom mig intet at være til Hinder for en saadan

19. **Lycodes frigidus**, Coll. 1878 (n. sp.).

Pl. III. fig. 23—24.

Lycodes vahlii, pt. Coll. (nec Reinh.) Forh. Vid. Selsk. Chra. 1878, No. 4, p. 11 (1878).
Lycodes frigidus, Coll. Forh. Vid. Selsk. Chra. 1878, No. 14, p. 45 (1878).

Diagnosis. — *Colour a uniform greyish-brown, tinged with red, no bands or spots. The entire body scaled, and in adults the base of the dorsal and anal; young individuals have generally the middle of the belly, the fins, and the region beneath naked. The height of the body is to the total length as 1 to $6^1/_2$, in immature examples the proportion can be as 1 to $9^1/_2$. Head depressed, its length being to the total length as 1 to 4—$4^1/_2$. Lateral line single, ventral. Width of interorbital space equals $^1/_{20}$ of the length of the head. Pyloric appendages wanting. Length reaching 510^{mm}, and above.*

M. B. 6. D. + $^1/_2$ C. 99—104; A. + $^1/_2$ C. 85—90; P. 20—21.

Locality (North Atl. Exped.): — Fifteen individuals, the greater part half grown, one probably an adult, were captured in the tract of ocean surrounding Beeren Eiland and Spitzbergen; and two (fry-specimens) on the banks off Helgeland and Lofoten, in Norway.

	Stat. 124.	*Stat.* 164.	*Stat.* 295.	*Stat.* 303.	*Stat.* 312.	*Stat.* 353.	*Stat.* 363.
Exact Locality.	325 Kil. W. Bodö.	117 Kil. W. Lofoten.	453 Kil. W. Hammerfest.	450 Kil. W. Beeren Eil.	108 Kil. W. Beeren Eil.	230 Kil. W. Isfj., Spitzb.	60 Kil. W. Norskø. Spitzb.
Depth.	350 Fathoms (640^m).	457 Fathoms (836^m).	1110 Fathoms (2030^m).	1200 Fathoms (2195^m).	658 Fathoms (1203^m).	1333 Fathoms (2438^m).	260 Fathoms (475^m).
Temp. at Bottom.	— 0.9° C.	— 0.7° C.	— 1.3° C.	— 1.6° C.	— 1.2° C.	— 1.4° C.	+ 1.1° C.
Bottom.	Clay.	Grey, sabulous Clay.	Biloculina Clay.	Brown Clay.	Brown and Grey Clay.	Bilocul. Clay and Stones.	Blue Clay.
Date.	19th June 1877.	29th June 1877.	14th July 1878.	19th July 1878.	22th July 1878.	10th Aug. 1878.	14th Aug. 1878.
Numb. of Specim.	1 Indiv. (fry).	1 Indiv. (fry).	5 Indiv. (1 adult).	1 Indiv.	5 Indiv. (young).	3 Indiv.	1 Indiv.

Remarks on the Synonomy. — When, in February 1878, I made a preliminary report of the fishes collected on the two first voyages of the Expedition (1876—77), a couple of fry-specimens of a *Lycodes* had been obtained, which, though exhibiting no traces of the transverse bands characteristic of that species, I referred to *L. vahlii*. The occurrence of a large, scaled *Lycodes* of a uniform colour in all stages of development was as yet unknown. Hence, the 2 fry-specimens were named and described along with the young example of *L. esmarkii*, taken at the same time, under the name *L. vahlii*, there being nothing in the structure of the body and the fins to oppose the assumption of

Sammenstilling. Efterat det sidste Aars Togt (1878) har bragt *L. frigidus*, der ikke tidligere var beskrevet, for Dagen i sin fuldt udvoxede Stand, henfører jeg uden Betænkning de nævnte 2 Yngel-Individer under denne Art, og afbilder det mindste af dem, sammen med et noget over halvvoxent Individ af Typ-Exemplarerne.

Udmaalinger. De 2 Yngel-Individer fra Bankerne udenfor de norske Kyster (1877) havde følgende Maal:

	Total-længde.	Hovedets Længde.	Legemets Højde (ved Begyndelsen af Dors.)	Snudens Afstand fra Dorsalen.	Snudens Afstand fra Anus.
A. (*Stat.* 164)	37 mm	9 mm	4,5 mm	10 mm	13,5 mm
B. (*Stat.* 124)	62 -	14 -	6,5 -	16 -	24 -

De øvrige Individer fra Havet omkring Beeren Eiland og Spitsbergen, erholdte under sidste Togt, 1878, havde følgende Maal:

	Total-længde.	Hovedets Længde.	Legemets Højde (ved Begyndelsen af Dors.)	Snudens Afstand fra Dorsalen.	Snudens Afstand fra Anus.
a. (*Stat.* 312)	118 mm	28 mm	12 mm	32 mm	48 mm
b. (*Stat.* 312)	139 -	31 -	14 -	36 -	55 -
c. (*Stat.* 312)	161 -	36 -	17 -	42 -	61 -
d. (*Stat.* 312)	179 -	38 -	20 -	42 -	70 -
e. (*Stat.* 312)	182 -	40 -	21 -	44 -	70 -
f. (*Stat.* 295)	238 -	53 -	28 -	67 -	100 -
g. (*Stat.* 363)	270 -	65 -	43 -	80 -	115 -
h. (*Stat.* 303)	325 -	81 -	45 -	103 -	148 -
i. (*Stat.* 295)	332 -	82 -	42 -	103 -	146 -
k. (*Stat.* 295)	339 -	85 -	46 -	108 -	157 -
l. (*Stat.* 295)	342 -	86 -	48 -	107 -	150 -
m. (*Stat.* 353)	345 -	88 -	50 -	112 -	159 -
n. (*Stat.* 353)	372 -	90 -	48 -	114 -	162 -
o. (*Stat.* 353)	375 -	95 -	49 -	115 -	170 -
p. (*Stat.* 295)	510 -	124 -	79 -	165 -	220 -

Beskrivelse. *Legemsbygning.* Med *Lycodes esmarkii* deler den nye Art omtrent Straaleantal og Skjælbeklædning, ligesom Legemsproportionerne idethele ere næsten overensstemmende hos begge Arter. Derimod adskiller den sig ved første Øjekast fra denne ved sin enkelte, lavtliggende Sidelinie, samt fra saavel *L. esmarkii*, som fra de øvrige Arter af samme Gruppe ved sit i alle Aldre ensfarvede Legeme.

Legemet er af typisk *Lycodes*-Bygning, saaledes hverken særdeles langstrakt, eller kort. Ungerne ere noget mere langstrakte, end de ældre, men selv Yngel af et Par Tommers Længde har en Legemshøjde, der er forholdsvis

identity. But the last voyage of the Expedition having brought to light *L. frigidus*, not previously described, in the adult stage of growth, I feel no hesitation in referring the said fry-specimens to that species; the smaller of the two I have figured, along with one of the typical specimens, rather more than half grown.

Measurements. — The two fry-individuals from the banks off the Norwegian coast (1877) measured as follows: —

	Total Length.	Length of the Head.	Height of Body (at commencem. of Dorsal).	Distance of Snout from Dorsal.	Distance of Snout from Vent.
A. (*Stat.* 164)	37 mm	9 mm	4.5 mm	10 mm	13.5 mm
B. (*Stat.* 124)	62 -	14 -	6.5 -	16 -	24 -

The remaining individuals, taken in the tract of ocean surrounding Beeren Eiland and Spitzbergen (1878), measured as follows: —

	Total Length.	Length of the Head.	Height of Body (at commencem. of Dorsal).	Distance of Snout from Dorsal.	Distance of Snout from Vent.
a. (*Stat.* 312)	118 mm	28 mm	12 mm	32 mm	48 mm
b. (*Stat.* 312)	139 -	31 -	14 -	36 -	55 -
c. (*Stat.* 312)	161 -	36 -	17 -	42 -	61 -
d. (*Stat.* 312)	179 -	38 -	20 -	42 -	70 -
e. (*Stat.* 312)	182 -	40 -	21 -	44 -	70 -
f. (*Stat.* 295)	238 -	53 -	28 -	67 -	100 -
g. (*Stat.* 363)	270 -	65 -	43 -	80 -	115 -
h. (*Stat.* 303)	325 -	81 -	45 -	103 -	148 -
i. (*Stat.* 295)	332 -	82 -	42 -	103 -	146 -
k. (*Stat.* 295)	339 -	85 -	46 -	108 -	157 -
l. (*Stat.* 295)	342 -	86 -	48 -	107 -	150 -
m. (*Stat.* 253)	345 -	88 -	50 -	112 -	159 -
n. (*Stat.* 353)	372 -	90 -	48 -	114 -	162 -
o. (*Stat.* 353)	375 -	95 -	49 -	115 -	170 -
p. (*Stat.* 295)	510 -	124 -	79 -	165 -	220 -

General Description. *Structure of the Body.* — The fin-ray formula and the scaled integument distinguishing the new species are very nearly the same as in *Lycodes esmarkii*; the dimensions of the body, too, correspond closely in the two species. On the other hand, it is seen at a glance to be distinct from *L. esmarkii*, by reason of the lateral line, which is single and ventral, and also from this and the other species of the same group, by the uniform colour of the body in all stages of growth.

The body is of the typical *Lycodes* structure, neither particularly elongate nor short. The young specimens are somewhat more elongated than the older examples, but even fry an inch or two in length have a depth of body

større, end hos nogen af de anguilliforme Arter. Hos Ungerne indeholdes Legemets Højde mellem $8^1/_2$ og $9^1/_2$ Gange i Totallængden, hos de fuldvoxne blot $6^1/_2$ Gange. Halepartiet er fra Siderne af temmelig stærkt sammentrykt (mindst hos Ungerne).

Hovedet er bredt, oventil temmelig fladtrykt, har forholdsvis lav Snude, og indeholdes i Totallængden 4 til $4^1/_2$ Gange.

Snudens Længde indtil Lindsen er omtrent lig Hovedets Højde over Øjnene, og indeholdes i Hovedlængden $2^1/_2$ til 3 Gange. Hovedets Længde bagenfor Lindsen er omtrent lig Hovedets største Bredde over Kinderne, og ubetydeligt større, end Hovedets største Højde midt over Nakken.

Underkjæven er betydeligt kortere, end Overkjæven, og denne sidste er kortere, end Hovedets halve Længde. Panden er forholdsvis bred; hos et Ex. (*o*), der er præpareret som Skelet, viser Interorbitalrummets smaleste Parti sig at udgjøre $^1/_{20}$ af Hovedets Længde. Som hos alle Lycoder findes langs begge Kjæver skaalformige Fordybninger, i hvis Bund der skjuler sig en Pore.

Næseborene ere enkelte, rørformige, og sidde temmelig nær Kjæveranden, og i en indbyrdes Afstand, der er omtrent lig Pectoralens Grundlinie.

Øjnene ere forholdsvis smaa; deres rette Begrændsning er vanskelig at drage, da Cornea tildels er bedækket af Hovedets Hud, hvorfor alle Dimensioner bedst regnes til eller fra Lindsen. De ere temmelig tætstaaende; Mellemrummet mellem Lindserne indeholdes næsten 2 Gange i deres Afstand fra Snudespidsen.

Tænderne ere, som hos alle typiske Lycoder, tilstede paa Mellem- og Underkjæven, paa Vomer og paa Palatinbenene. De ere forholdsvis ikke store; hos udvoxede Individer sidde de i Mellemkjæverne bagtil i en enkelt, paa Midten i en dobbelt, og fortil i en omtrent 3-dobbelt Række; paa Underkjæven danne de overalt flere Rækker. Paa Palatinbenene, hvor Tandrækken strækker sig tilbage lige hen under Øjnene, sidde de ligeledes i en enkelt Række; paa Vomer danne de omtrent 3 Rækker. Hos de yngre Individer ere Rækkerne, som sædvanligt, færre; hos de 2 Yngel-Individer ere ikke alle Tænder synlige over Tandkjødet.

Anus er omgiven af en hvidagtig, opsvulmet Hud, og ligger i en Afstand fra Snudespidsen, der indeholdes omtrent $2^1/_2$ Gange i Totallængden.

Af Totallængden udgjør . .	A. 37mm	B. 62mm	a. 118mm	c. 161mm	f. 238mm	h. 325mm	n. 372mm	o. 375mm	p. 510mm
Hovedets Længde . .	4,11	4,42	4,21	4,47	4,49	4,01	4,13	3,94	4,17
Legemets Højde . . .	8,32	9,59	9,83	9,47	8,50	7,22	7,75	7,65	6,45
Snudens Afstand fra D.	3,70	3,87	3,68	3,83	3,55	3,15	3,26	3,26	3,09
Snudens Afstand fra A.	2,74	2,58	2,45	2,63	2,38	2,19	2,20	2,20	2,31

relatively greater than any of the anguilliform species. In young examples, the depth of the body is to the total length as 1 to $8^1/_2$—$9^1/_2$; in full-grown specimens, as 1 to $6^1/_2$. The tail is rather compressed (least so in immature examples).

Head broad, the upper part flattish, with the snout depressed, and is contained in the total length from 4 to $4^1/_2$ times.

The length of the snout, as compared with the diameter of the lens, is about equal to the height of the head above the eyes, and is contained in the length of the head from twice and a half to three times. The length of the head posterior to the lens about equals the greatest breadth of the head across the cheeks, and slightly exceeds the greatest height of the head above the nape.

The mandible is considerably shorter than the upper jaw, the latter measuring less than half the length of the head. The forehead comparatively broad; in one specimen (*o*), preserved as a skeleton, the interorbital space measures where it is narrowest $^1/_{20}$ of the length of the head. As in all the *Lycodes*, circular depressions extend along both jaws, each concealing at the bottom a pore.

The nostrils are single, tubular, and placed in comparatively close proximity to the margin of the jaw, the distance between them being about equal to the length of the pectorals at base.

Eyes comparatively small; their exact limits are difficult to determine, the cornea being in part covered by the skin of the head; all dimensions should, therefore, be calculated to or from the lens. They are rather closely set, the space between the lenses being contained almost twice in their distance from the point of the snout.

Teeth, as in all typical *Lycodes*, on the inter-maxillary and in the lower jaw, the vomer, and the palatine bones; they are not large, comparatively. On the inter-maxillaries in adults, they are disposed, posteriorly in a single, midwards in a double, anteriorly in a triple series; in the lower jaw, they constitute several series. On the palatine bones, where the teeth extend back under the eyes, they are also arranged in a single series; on the vomer, they constitute as a rule three series. In immature examples, the series are as a rule less numerous; in the 2 fry-specimens, the teeth are not all perceptible.

The vent is surrounded by a whitish, tumid skin, its distance from the snout being to the total length as 1 to $2^1/_2$.

The T. Length contains	A. 37mm	B. 62mm	a. 118mm	c. 161mm	f. 238mm	h. 325mm	n. 372mm	o. 375mm	p. 510mm
Length of the head	4.11	4.42	4.21	4.47	4.49	4.01	4.13	3.94	4.17
Depth of the body . . .	8.32	9.59	9.83	9.47	8.50	7.22	7.75	7.65	6.45
Dist. of snout fr. dorsal . .	3.70	3.87	3.68	3.83	3.55	3.15	3.26	3.26	3.09
Dist. of snout fr. anal . . .	2.74	2.58	2.45	2.63	2.38	2.19	2.20	2:20	2.31

Appendices pyloricae har manglet hos de af mig aabnede Individer.

Finnerne. — Straaleantallet fandtes hos en Del undersøgte Individer at være følgende (i de verticale Finner er indbefattet den halve Caudal):

	A.	B.	a.	e.	f.	l.	m.	o.	p.
Dorsalen . .	102	103	99	103	104	102	103	103	102
Analen . . .	88	85	87	88	90	87	87	87	87
Pectoralerne	19	19	20	20	20	21	20 21	20	20

Dorsalen udspringer i en Afstand fra Gjællelaagets bagre Flig, der somoftest er lig Lindsens Afstand fra Snudespidsen, eller ubetydeligt mindre. Dens Afstand fra Snudespidsen indeholdes hos de større Individer omtrent 3 Gange, hos de mindre omtrent $3^1/_2$ Gange i Totallængden; dog er dette Forhold noget varierende. Dens første Straale ligger omtrent lige langt mellem Anus og Øjets Bagrand. Af Bygning er Dorsalen ganske, som hos de øvrige Lycoder, med sin største Højde i den forreste Del, og svagt aftagende bagtil.

Straalerne, som hos de større Individer ligge indhyllede i en tyk Hud, som ofte gjør dem vanskelige at tælle, ere mellem 93 og 98 i Antal; hvortil kommer Caudalens øvre Halvdel med 6 Straaler, tilsammen 99 til 104 Straaler. De ere alle (ogsaa den første) kløvede til Grunden, men begge Halvhele ere yderst spinkle og tætstaaende, ved Grunden uleddede, men udad fint articulerede, og i Spidserne divergerende.

Analen, der udspringer et Stykke bagenfor Anus, er af Bygning som Dorsalen, og tæller mellem 80 og 85 (gjennemsnitlig 82) Straaler, som, tilligemed Caudalens nedre Halvdel (der bestaar af 5 Straaler), udgjøre tilsammen 85 til 90 Straaler.

Caudalen danner 2 sammenhængende Straaleknipper, Dorsalsidens bestaaende af 6, Ventralsidens af 5 Straaler, der ere særdeles fine og yderst tætstaaende, og derfor vanskelige at tælle. Dens hele Længde er omtrent lig Længden af Ventralerne (eller hos de ældre Individer noget derover).

Pectoralerne have 19—21 Straaler, oftest 20, af hvilke de øvre ere de længste; hos enkelte Individer er Finnens nederste Del atter noget længere, end den mellemste, saaledes at Randen hos disse bliver svagt concav. De nedre Straaler ere beklædte med en tykkere Hud, end de øvrige, og have fri Spidser. Straalerne ere forholdsvis korte, saaledes at Finnen, naar den bøjes fremover, med sin Spidse blot hos de yngste Individer naar frem til Bagranden af Lindsen, men er hos de større en halv, hos det største (et sandsynligvis fuldt udvoxet Individ) endog en hel Øjendiameter fjernet fra denne. Hos dette sidste opnaar Pectoralen blot Hovedets halve Længde, hos de yngre noget mere, end denne. Straalerne ere alle kløvede til Roden, og fint articulerede.

Pyloric appendages wanting in all the specimens examined.

Fins. — The number of rays found in divers individuals examined was as follows (half of the caudal included in the vertical fins): —

	A.	B.	a.	e.	f.	l.	m.	o.	p.
Dorsal. . . .	102	103	99	103	104	102	103	103	102
Anal.	88	85	87	88	90	87	87	87	87
Pectorals . .	19	19	20	20	20	21	20 21	20	20

The dorsal commences at a distance from the posterior flap of the opercle generally equal to the distance from the lens to the point of the snout, or a trifle less. Its distance from the snout, in the larger specimens, is to the total length about as 1 to 3; in the smaller, about as 1 to $3^1/_2$; this proportion varies, however to some extent. Its first ray is about equidistant from the vent and the posterior margin of the eye. The structure of the dorsal as in all species of *Lycodes*, the greatest height of the fin being in its anterior portion.

The rays, which in the larger individuals are enveloped in a thick cutaneous integument, rendering them often difficult to count, number from 93 to 98, to which must be added those in the upper half of the caudal; so that the total number is from 99 to 104. They are all (including the first) cleft to the base; but both halves are exceedingly slender and close, simple at the base, but in the outer part finely articulated, and diverging at the points.

The anal, commencing a short distance posterior to the vent, is of the same structure as the dorsal, and furnished with from 80 to 85 (generally 82) rays, or, including the 5 rays in the lower half of the caudal, 85 to 90.

The caudal is composed of 2 continuous bunches of rays, that on the dorsal side with 6, that on the ventral side with 5 rays, exceedingly slender and very closely set; therefore difficult to count. The length of this fin about equals that of the ventrals (in the older specimens it exceeds it).

The pectorals are furnished with from 19 to 21 rays, most frequently with 20, of which the upper ones are the longest; in some individuals, the inferior portion of the fin is a trifle longer than the middle part, and its margin therefore slightly concave. The lower rays are enveloped in a thicker skin than the upper, and have free points. The rays are comparatively short, their points reaching forward to the posterior margin of the lens in the youngest specimen only, being in the larger examples distant from it one-half of the diameter of the eye, and in the largest individual a whole eye-diameter; in the latter, the pectorals do not attain more than half the length of the head; in the younger specimens, the proportion is greater. Rays all cleft to the base, and finely articulated.

Ventralerne ere korte, især hos de ældre, hvor de udgjøre $^1/_9$ af Hovedets Længde; de ere altid kortere, end Øjets Længdediameter. Hver af dem er indhyllet i en tyk Hud, der gjør det umuligt uden ved Dissection at adskille de enkelte Straaler; disses Antal synes at være 2, der begge ere kløvede til Grunden (idetmindste er dette Tilfældet hos de ældre).

Skjælbeklædning. Denne har hos *L. frigidus* en betydelig Udbredelse, og har allerede hos forholdsvis unge Individer opnaaet den største Del af sin Udvikling. Dog optræde mindre, individuelle Afvigelser, idet enkelte mindre Partier kunne være nøgne, som hos andre Ind. af samme Størrelse ere skjælbeklædte. Hos det største af de erholdte Individer (*p*) har Skjælbeklædningen naaet sin største Udbredelse; hos alle de øvrige ned til Indiv. *a* (med en Totallængde af 118^{mm}), er den i det store taget temmelig ligeligt udviklet.

Det Tidspunkt, da Skjælbeklædningen begynder at udvikle sig hos Yngelen, synes at være, naar denne har naaet en Længde af omtrent 50^{mm}. Hos det mindste af de erholdte Yngel-Individer, hvis Totallængde er blot 37^{mm}, er Legemet endnu ganske nøgent; hos det noget større Individ, hvis Totallængde er 62^{mm}, ere Skjællene fremspirende paa Legemets forreste Dele, medens Halen og Finnerne endnu ere nøgne.

Skjællene ere hos denne Art forholdsvis smaa og tætstillede. De ere størst paa den forreste Del af Halen og paa Legemets Sider; op imod Ryg- og Buglinien blive de betydeligt mindre, og ere særdeles smaa, hvor de optræde paa selve Finnerne, ligesom de blive mindre ud mod Halespidsen.

I sin fulde Udvikling er Legemet skjælbeklædt lige hen til Hovedet, og paa Bugsiden lige hen mod Grunden af Ventralerne. Ligeledes er Skjælbeklædningen her tilstede langs hele Grunden nærmest Dorsalen og Analen, og strækker sig ud over disse Finner indtil henimod deres Midte, længst paa Dorsalens mellemste Del, men ophører ganske henimod Finnernes Slutning. Paa Hovedet kan aldrig opdages Skjæl; ligeledes ere Pectoraler og Ventraler altid nøgne.

Hos de ikke fuldvoxne Exemplarer er i Regelen Nakken nøgen, ligesom Grunden langs Analen og Dorsalen, tilligemed disse Finner selv. Dog have enkelte mindre Individer ogsaa disse Partier skjælbeklædte, ligesom de udvoxede. Bugen er hos enkelte af disse yngre Individer fuldt skjælbeklædt, hos andre blot paa Siderne, ligesom Skjællene langs dennes Midte kunne delvis eller fuldkommen mangle.

For at vise Skjælbeklædningens Varieren hos de forskjellige Individer, meddeles kortelig dennes Fordeling hos alle de hidtil erholdte Exemplarer.

1. Fuld Skjælbeklædning lige hen mod Hovedet og paa Undersiden af Ventralerne; paa Finnerne er Grunden af Dorsalen og Analen skjælbeklædt (*k*, *l*, *p*).

2. Fuld Skjælbeklædning, som foregaaende, men Skjælbeklædningen strækker sig ikke ud over Analen (*f*).

The ventrals are short, particularly in the older examples, which have them one-ninth of the length of the head; they are invariably shorter than the longitudinal diameter of the eye. Each of them is enveloped in a thick cutaneous integument, dissection being necessary to distinguish the separate rays. The number would appear to be 2, both cleft to the base (at least in the older specimens).

Scales. — In *L. frigidus* the scaled integument is of considerable extent, and almost developed even in comparatively immature individuals. The scaling, however, cannot be termed strictly constant, exhibiting as it does minor individual differences, some examples having a few small patches naked, which in others of the same size are scaled. In the largest of the individuals obtained (*p*), the scaled integument has attained its greatest development; in all the others, including specimen *a*, total length 118^{mm}, it is on the whole very nearly of uniform extent.

The exact point of time at which the scales commence developing in the fry, would appear to be, when they have attained a length of about 50^{mm}. In the smallest of the fry-specimens, total length only 37^{mm}, the entire body is as yet naked; in the other, somewhat larger individual, total length 62^{mm}, the scales have begun to appear on the anterior parts of the body, whereas both the tail and the fins are as yet naked.

In this species, the scales are comparatively small, and closely set; the largest occur on the anterior portion of the tail, and down the sides of the body; near the dorsal and ventral lines they diminish considerably in size, being exceedingly small on the fins, and towards the tip of the tail.

When fully developed, the body is scaled up to the head, and, on the under surface, up to the base of the ventrals. The scaled integument extends, too, along the whole of the basal tract contiguous to the dorsal and anal, reaching nearly to the middle of those fins; it is longest on the middle of the dorsal, terminating near the extremity of the said fins. On the head, no scales can ever be detected; the pectorals and ventrals, too, are both invariably naked.

In the specimens not quite full-grown, the nape is as a rule scaleless, also the base of the body along the dorsal and anal, and the entire surface of those fins. One or two of the immature individuals, however, have these parts scaled, in common with the full-grown specimens. The belly in one or two of these immature examples scaled all over; in others, the sides only; the scales covering the middle portion sometimes wanting, wholly or in part.

The extent to which the scaling varies in the different specimens will be seen from the subjoined statement, briefly showing the distribution of the scales in all the individuals obtained.

1. Fully scaled to the head, and, on the under surface, within a short distance of the ventrals; the base of dorsal and anal scaled (*k*, *l*, *p*).

2. Fully scaled, as in the foregoing specimens; the scaled integument however not extending over the anal (*f*).

3. Næsten fuld Skjælbeklædning, men Nakken, Finnerne, samt Stykket mellem Anus og Analen ere nøgne (*i*).

4. Nakken, Finnerne, samt oftest tillige Grunden nærmest Dorsalen og Analen nøgen. Bugen er i Midten enten ganske nøgen, eller har blot en kort isoleret Skjælstribe fortil, medens Siderne af Bugen altid ere skjælbeklædte (*a, b, c, d, e, g, m, o*).

5. Som foregaaende; paa Legemets Sider strækker Skjælbeklædningen sig blot noget indenfor Pectoralens Spidse (*h, n*).

Sidelinien er enkelt, og særdeles lavtliggende (ventral). Den er hos de fleste Individer forholdsvis særdeles tydelig, og lader sig i Regelen med Lethed forfølge, ialfald i sin første Halvdel. Den udspringer ved Gjællespaltens øvre Ende, løber derfra hurtigt og skraat nedover omtrent midt under Pectoralens Midte, hvorfra den bøjer næsten ret bagover, og løber parallelt med Buglinien i ringe Højde over denne, indtil den har naaet omtrent over den 25de Straale af Analen (eller næsten Midten af denne Finne). Her synes den hos de fleste Individer at ophøre eller blive utydelig; hos enkelte lader den sig dog forfølge videre, idet den ved det nævnte Punkt gjør en liden Bøjning næsten lige ned til Grunden af Analen, og løber nu langs denne lige ud mod Halespidsen.

Porerne i Sidelinien ere forholdsvis smaa, hvidagtige, og forbundne indbyrdes med en smal Linie af samme Farve; de ere overalt temmelig tætstaaende, og jeg har talt omtrent 53 Stykker indtil Sideliniens Bøjning over Analens Midte.

Af Hovedets Slimporer kan mærkes en Række, bestaaende af omtrent 7 Porer, der udspringer paa hver Side af Panden, omtrent i en Øjendiameters Afstand bag Øjnene, og løber bagover mod Nakken, hvor den møder en tvergaaende, kortere Række af omtrent 3 Porer paa hver Side. Paa Gjællelaagene staar en vertical Række af omtrent 6 Porer. Endelig løber en Række, der i Regelen kun med Vanskelighed kan sees, fra Gjællespaltens øvre Ende bagover i ringe Afstand under Dorsalen; Mellemrummet mellem hver Pore er vexlende, men altid betydeligt større, end mellem Porerne i Sidelinien. Den ophører noget bagenfor Legemets Midte.

Farven er hos alle Individer ensartet mørkt rødagtig graa eller brungraa, uden Spor af Baand eller Pletter i nogen Alder. Skjællene ere ubetydeligt lysere, end Grundfarven. De yngre Individer ere noget lysere, end de ældre, og have brunligrød Dorsal og Anal. Bugsiden er kun ubetydeligt lysere, end Oversiden; hos yngre Individer er den blaasorte Bughinde gjennemskinnende. Alene Hovedets Underside er noget lysere, end Legemets øvrige Del; Anus' Rande ere hvidagtige. Mundhulen er hvid. Efterat have været opbevarede paa Spiritus er Farven bleven noget mattere.

Generationsorganerne vare hvilende. Det største Individ (*p*) var en Han; blot højre Testis var udviklet, medens den venstre var rudimentær, og havde en Negls Størrelse.

3. Almost fully scaled, the nape, fins, and the space between the vent and the anal only being naked (*i*).

4. The nape, the fins, and generally too the basal tract next to the dorsal and anal naked. The belly either wholly naked in the middle or with a scaly strip, which is short and isolated; the sides of the belly invariably scaled (*a, b, c, d, e, g, m, o*).

5. Similar to the foregoing; on the sides of the body, the scaled integument extends but very little farther than the extremity of the pectorals (*h, n*).

Lateral line single and low in position (ventral). In most of the individuals very distinct, comparatively, and may be easily traced, the first half at least. It commences at the upper extremity of the gill-opening, passing from thence obliquely downwards, about under the middle of the pectorals, where it bends almost straight backwards, running parallel to the ventral line, at a slight elevation above it till about over the 25th ray of the anal (or nearly to the middle of that fin): here, in most of the specimens, it would appear to terminate, or to become obsolete; in some, however, it may be traced some distance further: when such is the case, it makes at the said point a small bend, descending obliquely almost to the base of the anal, and accompanying that fin straight to the tip of the tail.

The pores in the lateral line are comparatively small, whitish, and connected together by a narrow line of the same colour; they are rather closely set, and I have counted as many as 53 from the origin to the bend above the middle of the anal.

Of the mucous pores of the head, may be mentioned a series consisting of 7 pores; it originates on each side of the forehead, distant about an eye-diameter from behind the eyes, extending backwards towards the nape, where it meets a transverse, shorter series of pores, mostly 3, on either side. On the opercles, there is a vertical series of about 6 pores. Finally a series, as a rule difficult to distinguish, extends backwards from the upper extremity of the gill-opening, a short distance under the dorsal; the space between these pores varies in extent, but is always considerably greater than that between the pores in the lateral line. The series terminates a little posterior to the middle of the body.

Colour in all specimens a uniform dark reddish-grey or brownish-grey, without a trace of bands or spots in any stage of development. Scales considerably lighter than the ground-colour. The younger individuals are somewhat lighter than the older, and have the dorsal and anal of a brownish-red. The under surface is but very little lighter than the upper; in the young specimens the bluish-black ventral membrane is translucent. The under surface of the head alone is somewhat lighter than the rest of the body; margin of vent whitish. Gape white. The action of spirits causes the colour to fade.

The generative organs were quiescent. The largest individual (*p*) (a male) had the right testis only developed; the left was rudimentary, and about half an inch in length.

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Føde. Hos de Individer, der aabnedes for at undersøge Ventrikelens Indhold, fandtes dette at udgjøre i Regelen mindre Dyr, især Crustaceer.

Individet *l*, optaget fra 1110 Favnes Dyb, indeholdt af bestembare Dele et Par Amphipoder, hvoriblandt en *Phoxus crenulatus*, (Boeck), samt en *Dulichia*, sp.; fremdeles et Exemplar af den blodrøde Decapode *Hymenodora glacialis* (Buchh.), et stort Individ af en Isopode, der tidligere var opført som *Idothea sabini*, Kr., men som af Prof. G. O. Sars i 1880 er beskreven som en ny Art under Navn af *Chiridothea megalura*. Endelig fandtes en Del *Calanus finmarchicus*, (Gunn.).

Individet *m*, optaget fra 1333 Favne, havde i Ventrikelen et usædvanligt stort Individ af *Themisto libellula*, (Mandt), et Exemplar af *Eurycope cornuta*, G. O. Sars, samt Dele af en Spongie.

Individet *o*, optaget sammen med foregaaende fra 1333 Favne, indeholdt et Exemplar af *Hymenodora glacialis*, (Buchh.), et Exemplar af den samme nye *Chiridothea megalura*, G. O. Sars, samt af Amphipoder *Themisto libellula*, (Mandt), samt en *Stegocephalus*, sp. Endelig fandtes Dele af Kappen af en Cephalopode, der maaske tilhørte den under Expeditionen fra et lignende Dyb optagne Art af Slægten *Cirrotheuthis*.

Individet *g*, optaget fra 260 Favnes Dyb, indeholdt af Amphipoder flere Exemplarer af *Themisto libellula*, (Mandt), samt et Exemplar af en *Anonyx*; af Isopoder *Eurycope cornuta*, G. O. Sars; af Copepoder *Calanus finmarchicus*, (Gunn.) i adskillige Exemplarer, samt et Individ af en endnu ubestemt Slægt af Calanider, der af Prof. Sars ansees for at staa nær Slægten *Euchaeta*; endelig af Cumaceer en *Diastylis stygia*, G. O. Sars.

Endelig fandtes i det største Individ (*p*), optagen fra 1110 Favnes Dyb, en stor *Pasiphaë tarda*, Kr.

Det fremgaar af disse Lycoders Næringsmidler, at de fleste af de velbekjendte, ægte pelagiske Sødyr, der til visse Tider i enorme Masser ere udbredte i de alleröverste Vandlag, ogsaa formaa at trænge ned til de allerstørste Dybder, hvor vi hidtil have kunnet granske Ishavets Dyreliv; og at Lycoderne maa opfattes som udprægede Bundfiske, og derfor blot kunne hente sine Næringsmidler ved eller paa Bunden, fremgaar bl. a. af den Omstændighed, at der blandt Næringsmidlerne hos *L. frigidus* indgaa Former, som den ovennævnte *Chiridothea*, der neppe er istand til at hæve sig synderligt op fra Bunden.

Opbevarede levende i et Kar ombord, udviste Individerne ringe Livlighed, men holdt sig gjerne stille i halvt sammenrullet Tilstand, omtrent saaledes, som man kan se hos *Zoarces viviparus*; Svømningen skeede med stærke Svingninger af Legemet. Da de lagdes paa Spiritus, vare de dog yderst voldsomme, og viste sig, som de fleste Bundfiske, temmelig seiglivede.

Udbredelse. Under den Forudsætning, at de oftere nævnte 2 spæde Yngel-Individer, der optoges paa Havbroens ydre Skraaning udenfor Lofoten og Helgeland i Norge, ere identiske med *L. frigidus*, foreligger Arten fra den is-

Food. — In the individuals opened with the object of examining the contents of the ventricles, the food was found to consist chiefly of small animals, in particular crustaceans.

Specimen *l*, taken at a depth of 1110 fathoms, had in its stomach determinable parts of Amphipods, amongst which were a *Phoxus crenulatus*, (Boeck), and a *Dulichia*, sp.; also an example of the crimson Decapod, *Hymenodora glacialis*, (Buchh.), a large Isopod, formerly mentioned as *Idothea sabini*, Kr., but which Prof. G. O. Sars, in 1880, described as a new species under the name of *Chiridothea megalura*; finally, divers examples of *Calanus finmarchicus*, (Gunn.).

Specimen *m*, taken at a depth of 1333 fathoms, had in its ventricle an exceptionally large individual of *Themisto libellula*, (Mandt), an example of *Eurycope cornuta*, G. O. Sars, and parts of a sponge.

Specimen *o*, taken with the foregoing example at a depth of 1333 fathoms, had in its stomach an example of *Hymenodora glacialis*, (Buchh.), an individual of the new species *Chiridothea megalura* (G. O. Sars), and of Amphipods, *Themisto libellula*, (Mandt), and a *Stegocephalus*, sp.; finally, parts of a Cephalopod, possibly belonging to the species of the genus *Cirrotheuthis* obtained on the Expedition from a similar depth.

Specimen *g*, taken at a depth of 260 fathoms, had in its stomach — of Amphipods: divers examples of *Themisto libellula*, (Mandt), and an *Anonyx*; of Isopods: *Eurycope cornuta*, G. O. Sars; of Copepods: *Calanus finmarchicus*, (Gunn.) divers examples, and an individual of a genus of Calanids, not yet determined, which Prof. Sars believes to be a near congener of the genus *Euchæta*; finally, of Cumaceans: a *Diastylis stygia*, G. O. Sars.

The ventricle of the largest specimen (*p*), taken at a depth of 1110 fathoms, contained a large *Pasiphaë tarda*, Kr.

It is evident from the food on which these *Lycodes* subsist, that most of the well known, true pelagic animals, which, at certain seasons, occur in vast quantities near the surface, can descend to the greatest depths in which we have as yet been able to investigate the Fauna of the Polar Seas; and that the *Lycodes* — which must unquestionably be regarded as strongly marked bottom-fishes — *do* seek means of subsistence on or near the bottom, is shown, for instance, by the circumstance, that the food of *L. frigidus* comprises forms such as the above-mentioned *Chiridothea*, which can hardly ascend far from the bottom.

Preserved alive on board in a tub of water, the individuals displayed but little vivacity, remaining the greater part of the time half rolled up and motionless, much the same as *Zoarces viviparus*; in swimming the body is powerfully vibrated. On being immersed in spirits, they were exceedingly violent in their movements, and proved rather tenacious of life.

Distribution. — Assuming the 2 fry-specimens (of which mention has been repeatedly made) that were taken on the outer slope of the great bank, or "sea-bridge," (Havbro), off Lofoten and Helgeland, in Norway, to be

kolde Area lige fra Spitsbergens Vestkyst, og ned forbi Finmarken indtil søndenfor Polarcirkelen. Da Trawlnettet gjentagne Gange har bragt flere Individer for Lyset i det samme Kast, synes de ikke at være sparsomt fordelte, men høre maaske blandt de ægte Dybvandsarter til de hyppigere Bundfiske.

Samtlige Individer optoges fra en betydelig Dybde, 260 til 1330 Favne, og alle, paa en enkelt Undtagelse nær, fra det iskolde Vand.

identical with *L. frigidus*, the range of the species in the cold area extends from the west coast of Spitzbergen past Finmark to some distance south of the Arctic circle. Several individuals having been frequently brought up at once in the trawl-net, it would not appear to be sparingly distributed, and of the true deep-sea forms it possibly belongs to the commoner bottom-fishes.

The specimens were all of them taken at a considerable depth, from 260 to 1330 fathoms, and, with one exception, all in water of a temperature below that of ice.

20. **Lycodes lütkenii,** n. sp.

Pl. III, Fig. 25.

Lycodes reticulatus, Coll. (nec Reinh.) Forh. Vid. Selsk. Chra. 1878, No. 14, p. 59 (1878).

Diagn. *Nærmest beslægtet med L. reticulatus, Reinh. Farven lyst graaagtig, med utydelige mørke Felter nedad Legemet, og hvidt Nakkebaand; disse Felter ere i Dorsalen næsten sorte. Hovedet iøvrigt uplettet. Skjællene beklæde hele Legemet til et Punkt lige under Pectoralens indre Trediedel; Finnerne, Hovedet, Bugen, Nakken, samt Grunden langs Analen og langs Begyndelsen af Dorsalen nøgen. Legemets Højde indeholdes neppe $6^1/_2$ Gange, Hovedets Længde ikke fuldt 4 Gange i Totall. Sidelinien enkelt, medio-lateral. Pandens Bredde indeholdes 16 Gange i Hovedets Længde. Pectoralerne særdeles store, indeholdes $5^1/_2$ Gange i Totallængden. 2 yderst korte Appendices pyloricae. Størrelsen (af det eneste Individ, en Hun) 370*^{mm}.

M. B. 6. D. (+ $^1/_2$ C.) 94; A. (+ $^1/_2$ C.) 76; P. 23.

Localit. fra Nordh. Exped. Havet vestenfor Nord-Spitsbergen.

	Stat. 362.
Beliggenhed.	115 Kil. V. Norskøerne, Spitsbergen.
Dybde.	459 Favne (839^{m}).
Temp. paa Bunden.	— 1,0° C.
Bunden.	Blaagraat Ler.
Datum.	14de August 1878.
Antal Indiv.	1 Indiv.

Bemærkninger til Synonymien. Forhaandenværende Individ, det eneste, der foreligger, henførte jeg ved den foreløbige Beretning om Udbyttet af sidste Aars Togt under *L. reticulatus*, Reinh. (Forh. Vid. Selsk. Chra. 1878, No. 14), da Individet i alle Hovedtræk, saaledes i Tandbygning, Straaleantal i de verticale Finner, Skjælbeklædning,

20. **Lycodes lütkenii,** n. sp.

Pl. III, fig. 25.

Lycodes reticulatus, Coll. (nec Reinh.) Forh. Vid. Selsk. Chra. 1878, No. 14, p. 59 (1878).

Diagnosis. — *Nearly related to L. reticulatus, Reinh. Colour a light grey, with indistinct dark patches (almost black on the dorsal) down the body, and white nuchal bands; the rest of the head uniform. The entire body scaled to a point opposite the inner third of the pectorals; the fins, head, belly, nape, and basal tract along the anal and commencement of the dorsal naked. The height of the body is contained not quite $6^1/_2$ times, the length of the head nearly 4 times, in the total length. Lateral line single, medio-lateral. Width of the frontal bone $^1/_{16}$ of the length of the head. Pectorals exceedingly large, contained $5^1/_2$ times in the total length. Pyloric appendages two, very short. Length (of the only specimen: a female) 370*^{mm}.

M. B. 6. D. (+ $^1/_2$ C.) 94; A. (+ $^1/_2$ C.) 76; P. 23.

Locality (North Atl. Exped.): — The open sea, west of North Spitzbergen.

	Stat. 362.
Exact Locality.	115 Kil. W. Norskøerne, Spitzbergen.
Depth.	459 Fathoms (839^{m}).
Temp. at Bottom.	— 1.0° C.
Bottom.	Bluish-grey Clay.
Date.	14th August 1878.
Numb. of Specim.	1 Indiv.

Remarks on the Synonymy. — The individual here described, the only specimen yet obtained, I referred in my preliminary report on the results of the last voyage of the Expedition to *L. reticulatus*, Reinh. (Forh. Vid. Selsk. Chra. 1878, No. 14), agreeing as it did in all salient features, viz. the dentition, the number of rays in the vertical fins,

Sidelinie, samt tildels Legemsbygning stemmede overens med den nævnte Art, medens det dog var indlysende, at der fandt enkelte Uoverensstemmelser Sted mellem dem. Den fornyede Undersøgelse, som jeg ved Dr. Lütkens og Prof. Steindachner's Velvillie har været istand til at anstille ogsaa i det sidst forløbne Aar over Typ-Exemplarerne af *L. reticulatus* fra Grønland i Kjøbenhavner-Musæet og i Musæet i Wien, sammenholdt med de Resultater, hvortil Dr. Lütkens egne Undersøgelser over disse Individer have ført (Vid. Medd. Nat. Foren. Kbhvn. 1880, p. 307), har dog bevirket, at jeg i Overensstemmelse med den nævnte Forsker anser det rettest at opføre det spitsbergenske Individ under en egen Art, for hvilken Navnet *L. lütkenii* foreslaaes.

Sammenlignet med *L. reticulatus* udmærker den nye Art sig væsentlig ved følgende:

Medens Farven hos alle de i Kjøbenhavner-Musæet opbevarede udvoxede Ind. af *L. reticulatus*, tilligemed et, ligeledes udvoxet og udmærket vel bevaret Ind., der opbevares i Musæet i Wien, er characteristisk ved sine (oprindelig af mørke Felter fremgaaede) reticulerede sorte Linier, der omgive Felter af den lysere Bundfarve, og som ere stillede i mere eller mindre regelmæssig Række nedad Legemet, er hos det nye Individ *(L. lütkenii)* neppe Spor af disse sorte Linier, men Bundfarven er her lyst graaagtig, kun med yderst svage Antydninger til mørke Felter over Kroppen, medens derimod Dorsalen viser afvexlende sorte og lyse Partier; endvidere mangler Snuden de hvide, skarpt markerede ringformige Tegninger, der findes hos næsten alle Individer af *L. reticulatus*.

Legemsbygningen er hos *L. lütkenii* mere undersætsig. Hos *L. reticulatus* indeholdes Legemets Højde 7—8 Gange i Totallængden, hos *L. lütkenii* neppe $6^1/_2$ Gange i denne.

Den, som det synes, mest paafaldende Ulighed mellem begge Arter frembyder Pectoralernes Bygning. Hos *L. lütkenii* ere nemlig disse større og bredere, end hos nogen af de øvrige bekjendte Lycoder, og udbredes de vifteformigt, rage de, uagtet Individets betydelige Legemshøjde, et godt Stykke udover Legemets Ryg- og Bugside. I Totallængden indeholdes de blot $5^1/_2$ Gange, medens de hos *L. reticulatus* indeholdes 7—9 Gange i denne. Fremdeles er Straaleantallet højere hos *L. lütkenii*, nemlig 23, medens Dr. Lütken hos den anden Art har kun sjeldent fundet 21, men i Regelen blot 19—20.

Iøvrigt ere, som ovenfor berørt, Overensstemmelserne mellem begge Arter ganske betydelige, og der findes ingen væsentlig Forskjel i Sideliniens og Tændernes Bygning, eller i Skjælbeklædningens Udstrækning, ligesom de 2 Arter idethele maa siges at være overensstemmende i sit almindelige ydre Habitus. Sandsynligvis bør de dog opfattes som 2 nærstaaende Arter, der i sin udvoxede Stand kunne adskilles ved de ovenfor paapegede Forskjelligheder i Farvetegning, Legemshøjde, og i Pectoralernes Bygning; om de derimod i sine yngre Stadier vise en ligesaa paatagelig Forskjel, er os endnu ganske ubekjendt, men idethele mindre sandsynligt.

the lateral line, the scales, and to a certain extent the structure of the body, with that species, though several minor points of divergence evidently existed between them. The subsequent examination which Dr. Lütken and Prof. Steindachner kindly enabled me to make last year of the typical specimens from Greenland, preserved in the museums of Copenhagen and Vienna, tested by the results with which Dr. Lütken's own researches in connexion with the said individuals have been attended (Vid. Medd. Naturh. Foren. Kbhvn. 1880, p. 307), induces me to establish the Spitzbergen example, in accordance with the views of that naturalist, as a separate species, for which the name of *L. lütkenii* is suggested.

Compared with *L. reticulatus*, the new species is chiefly distinguished by the following characteristics: —

The coloration in all the full-grown examples of *L. reticulatus* preserved in the Copenhagen museum, and in one, also an adult and in an excellent state of preservation, in the museum at Vienna, is characterised by reticular black lines (issuing from dark patches), which surround large patches of the lighter ground-colour, and are arranged in a more or less regular series extending down the body, whereas there is scarcely a trace of these black lines in the specimen of *L. lütkenii*; the ground-colour in this individual is a light grey, with but the faintest indications of dark patches over the body; the dorsal, on the other hand, exhibits an alternation of dark and light patches; moreover, the snout has none of the white annular markings observed in almost all individuals of *L. reticulatus*.

The structure of the body in *L. lütkenii* is more thickset. In *L. reticulatus*, the height of the body is contained 7—8 times in the total length; in *L. lütkenii*, not quite $6^1/_2$.

But the most striking dissimilarity between the two species is, I think, exhibited in the structure of the pectorals. In *L. lütkenii*, these fins are larger and broader than in any of the other *Lycodes*, and, spreading like a fan, they project, notwithstanding the very considerable depth of body, some distance above and below the dorsal and ventral margins. They are contained only 5 times and a half in the total length, whereas in *L. reticulatus* they are contained 7—9 times. Moreover, the number of rays is greater in *L. lütkenii*, viz. 23, whereas in the other species Dr. Lütken has only once found 21, generally not more than 19—20.

For the rest, the two species resemble each other closely, and there is no material difference in the lateral line, or in the structure of the teeth, or in the extent of the scaled integument; on the whole, too, they must be said to agree in their habitus. Probably, however, they should be regarded as nearly related species, which in the adult stage of growth may be distinguished by the differences pointed out above in the coloration, the height of the body, and the structure of the pectorals; but whether they exhibit an equally obvious distinction in the earlier stages of development, is a question which we are as yet wholly unable to answer; that such should be the case is however not very probable.

Det bliver i denne Forbindelse nødvendigt kortelig at omtale et Par Yngelformer af Lycoder, der hidtil ere blevne opførte som distincte Arter, medens de sandsynligvis blot udgjøre de unge Stadier af 1, eller maaske 2 Arter, der i sin fuldt udvoxede Tilstand ere dem betydeligt ulige i Farvetegning og Skjælbeklædning. Disse Former ere: *L. perspicillum*, Kr. 1844, fra Grønland, *L. rossi*, Malmgr. 1864, fra Spitsbergen, samt *L. gracilis*, M. Sars 1866, fra Norge; det er sandsynligt, at alle disse blot udgjøre Ungdomsstadiet enten alene af *L. reticulatus*, eller tillige af en anden Art, der staar denne nær, maaske *L. lütkenii*.

I 1844 anmeldte Krøyer med en kort og foreløbig Diagnose en ny *Lycodes* fra Grønland under Navn af *L. perspicillum*, og afbildede den nye Art i Gaimards Voy. etc. Poiss., pl. 7, men gav den først i 1863 i Naturh. Tidsskr. 3 R. 1 B. en udførlig Beskrivelse. Af denne Art forelaa 2 Individer med en Totallængde af 39—65 mm, af hvilke jeg ved Dr. Lütkens Imødekommen har kunnet undersøge det største i Museet i Kjøbenhavn. Paa den brungule Bundfarve har det 8 brede, i Midten lysere Felter, ligesom et hvidagtigt Baand forbinder begge Gjællespalter; denne Farvetegning viser en saa paafaldende Overensstemmelse med den, der findes hos det mindste af Typ-Individerne af *L. reticulatus*, der ligeledes opbevares i Kjøbenhavn, og hvis Totall. er 223 mm, at der nødvendigvis maa opstaa en Formodning om begge Arters Identitet. Den væsentligste Forandring, der er foregaaet med det omhandlede unge Individ af *L. reticulatus* er, at de mørke Felter, der findes hos *L. perspicillum*, ere blevne mindre skarpt begrændsede, ligesom de begynde at bære Spor af de mørkere reticulerede Linier, der hos de mere udvoxede Individer blive de mest fremtrædende Træk i Farvetegningen hos denne Art.

Finnestraalernes Antal, som hos *L. reticulatus*, ifølge Dr. Lütken, varierer i Dorsalen mellem 91 og 95, i Analen mellem 75 og 76 (eller en Gang 70), er hos *L. perspicillum*, ifølge Krøyer, D. 80, A. 65; de ere saaledes vistnok noget færre, men Tallet tør maaske ikke være correct, hvad Krøyer selv anfører tildels tør være Tilfældet[1]; eller man kunde antage Muligheden af, at der yderligere under Væxten vilde udvikle sig et Par nye Hvirvler og tilsvarende Straaler.

Derimod beror Uoverensstemmelsen i Skjælbeklædningens Udstrækning utvivlsomt paa Individets unge Alder, sammenlignet med de udvoxede Individer af *L. reticulatus*. Medens nemlig de sidste ere skjælbeklædte paa Legemet hen til Pectoralens ydre Trediedel, medens hele Bugen og den forreste Del af Ryggen er nøgen, ere Skjællene hos *L. perspicillum*, efter hvad jeg selv har kunnet overbevise mig om, netop i sit første Frembrud paa Halepartiet, medens Skjælbeklædningen paa Legemets Sider strækker sig frem til Midten af Pectoralen. Det er saaledes klart,

[1] Naturh. Tidsskr. 3 R. 1 B. p. 291.

Here it is necessary to make brief mention of certain fry-specimens of one or two forms of *Lycodes* hitherto regarded as distinct species, though in all probability merely representing 1, or possibly 2, species in the early stages of development, which, when full-grown, are found to have undergone a striking change in coloration and the extent of the scaled integument. The forms in question are as follows: — *L. perspicillum*, Kr. 1844, from Greenland; *L. rossi*, Malmgr. 1864, from Spitzbergen; and *L. gracilis*, M. Sars, 1866, from Norway; and they are probably all of them examples either of *L. reticulatus* or of some other species nearly related to it, possibly *L. lütkenii* in an early stage of development.

In 1844 Kröyer announced, with a preliminary diagnosis, the occurrence of a new *Lycodes* off the coast of Greenland, under the name of *L. perspicillum*, and figured it in Gaimard's Voy. &c. Poiss, pl. 7, but did not furnish a detailed description till 1863, in Naturh. Tidsskr. 3 R. 1 B. Of this species two examples had been obtained, total length respectively 39 and 65 mm, the largest of which, preserved in the Copenhagen Museum, Dr. Lütken kindly permitted me to examine. Over the brownish-yellow ground-colour are distributed 8 broad patches, lighter in the middle; and a whitish band connects the gill-openings. Now, this peculiarity of coloration exhibits so striking a resemblance to that distinguishing the smallest of the typical specimens of *L. reticulatus*, also preserved in Copenhagen (total length 223 mm), that the identity of the two species cannot but suggest itself. The principal change which this immature example of *L. reticulatus* has undergone, consists in the dark patches characteristic of *L. perspicillum* having become less sharply defined, and in their commencing to show indications of the dark reticular lines, which, in a more advanced stage of development, are the most prominent characteristics of coloration in this species.

The number of fin-rays, which in *L. reticulatus*, according to Dr. Lütken, varies in the dorsal between 91 and 95, in the anal between 75 and 76 (in one specimen 70), is in *L. perspicillum*, according to Kröyer, D. 80, A. 65: this is certainly a somewhat smaller number; but it may possibly be incorrectly given, which Kröyer himself suggests as not improbable, to a certain extent[1]; or the development during the further progress of growth of one or two additional vertebræ and rays might be assumed.

On the other hand, the want of agreement in the extent of the scaled integument, as compared with that distinguishing adults of *L. reticulatus*, must unquestionably be ascribed to the immaturity of the individual. The former are scaled on the body as far as the outer third of the pectorals, the whole of the belly and the anterior part of the back being naked, whereas in *L. perspicillum* the scales (a fact of which from my own examination I am convinced) are just beginning to develop over the caudal region, but on the sides of the body they extend to the middle of the

[1] Naturh. Tidsskr. 3 R. 1 B. p. 291.

at Skjællene efterhaanden skulle beklæde et større Parti af Legemet, end det, som Krøyer i sin Beskrivelse angiver, idet han ikke synes at have iagttaget de fremspirende Skjæl paa Halen.

L. perspicillum er med andre Ord en spæd Unge, som godt kan antages senere at ville forandre sin Farvetegning, ligesom den endnu ikke havde faaet sin fulde Skjælbeklædning. Da Legemsforholdene iøvrigt hos begge ere overensstemmende, er det ikke usandsynligt, at i de nærmest paafølgende Stadier af denne Forms Liv ville de mørke Tverfelter efterhaanden lysne, og blive forandrede til mindre Pletter eller reticulerede Linier, saaledes som det netop viser sig hos det ovenfor omtalte unge, grønlandske Individ af *L. reticulatus* med en Totallængde af 223^{mm}.

Den næste i Rækken er *L. rossi*, opstillet af Malmgren i 1864 i Öfv. Kgl. Vet. Akad. Förh. efter et Individ fra Spitsbergen, erholdt under en af de første svenske Expeditioner til denne Øgruppe. Dette Individ havde en Totallængde af blot 32^{mm}, og et Straaleantal af: D. 82, A. 63; i Farvetegning var det fuldkommen overensstemmende med *L. perspicillum*, men Individet var, i Modsætning til dette, helt nøgent.

Det var paa Grund af det sidstnævnte Forhold, at Malmgren troede at burde opstille det som en distinct Art, skilt fra *L. perspicillum*. Men da *L. perspicillum*, som ovenfor nævnt, netop befandt sig i det Stadium, da Skjællene vare i Frembrud, og Skjælbeklædningen endnu ikke var fuldt udviklet, skjønt det beskrevne Individ havde en Totallængde af 65^{mm}, er det ikke uventet, at en spæd Unge med en Totallængde af blot 32^{mm}, som *L. rossi*, endnu intet Spor viser af nogen Skjælbeklædning. Ved velvillig Imødekommen af Prof. Smitt har jeg erholdt til Undersøgelse dette Individ, og jeg kunde ingen væsentlig Forskjel opdage mellem dette og *L. perspicillum*.

Da endelig Prof. M. Sars i 1866 i Christiania Videnskabs-Selskabs Forh. opstillede sin *L. gracilis* efter et i Drøbaksund i Christianiafjorden erholdt Individ med en Totallængde af 43^{mm}, skeede dette alene af den Grund, at hans Exemplar havde 10 mørke Tverfelter over Legemet, medens *L. rossi* blot havde 8, og da fremdeles hans Exemplar var nøgent, ligesom *L. rossi*, kunde det ikke henføres under *L. perspicillum*. Men allerede Krøyer har paavist, at hans 2 Typ-Exemplarer af *L. perspicillum* ingenlunde vare fuldt overensstemmende i Tegningen af Kroppen; og hvad Skjælbeklædningen angaar, gjælder det samme, som ovenfor er anført under *L. rossi*.

Dog maa paa dette Sted bemærkes, at Krøyers ene Typ-Exemplar blot var 39^{mm} langt (saaledes mindre end *L. gracilis*), og dog nævner han intet om, at der var nogen Forskjel mellem de 2 Individer med Hensyn til Skjælbeklædningen; men selv om denne i Virkeligheden hos begge[1] har været lige, haves der Exempler paa, at dennes Udvik-

[1] Dette Forhold lader sig ikke længere oplyse. Ifølge Dr. Lütken er saavel det mindste Exemplar af *L. perspicillum*, som det eneste af *L. nebulosus* ikke til at finde paa Musæet i Kjøbenhavn, og sandsynligvis ere de forsvundne.

pectorals. Hence it is evident, that a larger part of the body will gradually become scaled than is stated by Krøyer, who does not appear to have observed these incipient scales on the tail.

L. perspicillum is, in short, a very young individual, in which a subsequent change of coloration may not unreasonably be assumed: as we have seen, the scaled integument had not yet attained its full development. The proportions of the body being in all respects the same in both, it does not appear improbable that, in the succeeding stages of growth, the dark transverse patches will gradually become lighter, and change to smaller spots or reticular lines, as is seen to be the case with the smallest Greenland specimen of *L. reticulatus*, total length 223^{mm}.

The next of the proposed forms is *L. rossi*, established by Malmgren, in 1864 (Öfv. Kgl. Vet. Akad. Forh.), from a specimen taken off Spitzbergen on one of the first Swedish expeditions to that group of islands. This individual had a length of only 32^{mm}, the number of fin-rays being: D. 82, A. 63; in coloration, it agreed precisely with *L. perspicillum*, but differed from that form in being naked.

It was this feature which Malmgren deemed sufficient to warrant his establishing it as a separate species. But the specimen of *L. perspicillum*, though with a total length of 65^{mm}, having, as stated above, not yet reached the stage of growth in which the scales begin to form (of some of the scales indications had only just begun to appear), it is not surprising that a very young individual such as *L. rossi*, having a total length of only 32^{mm}, should as yet be without the slightest trace of scales. On application to Prof. Smitt, this individual was kindly lent me for examination, but I failed to detect any essential feature distinguishing it from *L. perspicillum*.

Finally, when Prof. M. Sars in 1866 (Christiania Videnskabs Selskabs Forh.) described his *L. gracilis*, from an individual with a total length of 43^{mm}, taken in Drøbak Sound, in the Christiania Fjord, his sole reason for doing so lay in the said example having 10 dark transverse patches across the body, instead of 8, the number in *L. rossi*; and his specimen being, like the latter, naked, it could not be referred to *L. perspicillum*. But Kröyer had already shown that his two typical specimens of *L. perspicillum* did not by any means exhibit perfect agreement in the marking of the body; and with regard to the scaled integument, what has been said in connexion with *L. rossi*, will apply with equal force here.

The fact, however, must not be passed by, that one of Kröyer's typical specimens was only 39^{mm} long (accordingly of smaller dimensions than *L. gracilis*); and yet no mention whatever is made of any difference between the two individuals as regards the scaled integument; but even assuming it to have been the same in both,[1] instances

[1] Unfortunately, it is no longer possible to settle this question. According to Dr. Lütken, the smallest specimen of *L. perspicillum* and the only one yet obtained of *L. nebulosus*, could not be found in the Copenhagen Museum, and are no doubt both of them lost.

ling foregaar højst forskjelligt hos de forskjellige Individer (cfr., hvad nedenfor anføres under *L. muraena*). Den umiddelbare Sammenligning mellem *L. rossi* og *L. gracilis* har desuden fuldstændigt overbevist mig om, at disse ere identiske.

are not wanting to show that its development can vary to a great extent in different individuals (*vide* what is stated overleaf in connexion with *L. muraena*). A direct comparison of *L. rossi* with *L. gracilis* has fully convinced me of their identity.

L. gracilis, M. Sars. Christiania-Fjord, Norge (1/1).

Hovedsummen af de ovenfor anførte Bemærkninger er, at medens der er overvejende Sandsynlighed for, at *L. perspicillum*, Kr. 1844, *L. rossi*, Malmgr. 1864, og *L. gracilis*, M. Sars 1866, ere alle identiske, vil det først med et større Materiale, end det, som for Tiden foreligger i Musæerne, kunne afgjøres, om disse Ungdomsformer tilhøre den som mere udvoxet under Navnet *L. reticulatus*, Reinh. 1838, bekjendte Art, eller maaske tillige en anden nærstaaende Art, der i dette Tilfælde kunde være *L. lütkenii*.

From the data set forth in the above observations there is, I opine, every reason to infer, that *L. perspicillum*, Kr. 1844; *L. rossi*, Malmgr. 1864; and *L. gracilis*, M. Sars 1866, are all three identical; but whether the individuals representing these early stages of development belong to *L. reticulatus*, Reinh. 1838, or possibly to some other nearly related species, which in that case might be *L. lütkenii*, must be left an open question till more extensive materials shall have been furnished us than our museums at present afford.

Udmaalinger.

Totallængde (Hun)	370mm.
Legemets største Højde (ved Begyndelsen af Dorsalen)	58 -
Legemets Højde ved Begyndelsen af Analen	47 -
Snudens Afstand fra Dorsalen	111 -
Snudens Afstand fra Anus	175 -
Anus' Afstand fra Halespidsen (Halens Længde)	195 -
Hovedets Længde	95 -
Snudens Længde (til Iris)	31 -
Øjets Længde (Iris' Længdediameter)	13 -
Hovedets postorbitale Del (fra Bagranden af Iris)	52 -
Interorbitalrummet (mellem begge Irides)	12 -
Overkjævens Længde	42 -
Hovedets Højde over Øjnene	37 -
Hovedets Højde lige bag Ventralerne	48 -
Ventralernes Afstand fra Anus	107 -
Pectoralens Grundlinie	28 -
Pectoralens største Længde	64 -
Pectoralens Afstand fra Anus	30 -

Measurements.

Total length (female)	370mm
Greatest height of body (at origin of dorsal)	58 -
Height of body (at origin of anal)	47 -
Distance of snout from dorsal	111 -
Distance of snout from vent	175 -
Distance of vent from tip of tail (length of tail)	195 -
Length of the head	95 -
Length of snout (to iris)	31 -
Length of the eye (longitudinal diameter of iris)	13 -
Postorb. region of head (from post. marg. of iris)	52 -
Interorbital space (between the irides)	12 -
Length of upper jaw	42 -
Height of head above the eyes	37 -
Height of head immediately posterior to ventrals	48 -
Distance of ventrals from vent	107 -
Base of pectorals	28 -
Greatest length of pectorals	64 -
Distance of pectorals from vent	30 -

Beskrivelse. *Legemsbygning.* I det hovedsagelige stemmer *L. lütkenii*, som ovenfor under Bemærkningerne til Synonymien er paapeget, i sin Skjælbeklædning, Legemsbygning og Straaleantal overens med *L. reticulatus*, men den kan skilles fra denne bl. a. ved sit kortere og stærkere Legeme, ved Pectoralernes betydelige Størrelse, samt ved Farvetegningen.

Legemet er forholdsvis særdeles undersætsigt og stærktbygget; dets Højde indeholdes ikke fuldt $6^{1}/_{2}$ Gange i Totallængden (et Forhold, der blot er naaet af det største Individ af *L. frigidus*, en Han, hvis Totallængde var noget over 500mm).

Hovedet er forholdsvis stort, skjønt Individet er en Hun; og indeholdes ikke fuldt 4 Gange i Totallængden. Snuden er temmelig fladtrykt; Øjnene ere relativt smaa, og indeholdes i Hovedlængden $9^{1}/_{2}$ Gange. Paa Craniet

General Description. *Structure of the Body.* — As previously observed when treating of the synonomy, *L. lütkenii* agrees in all essential particulars, viz. the development of the scaled integument, the structure of the body, and the number of fin-rays, with *L. reticulatus*, but may be distinguished from that species by its body, which is shorter and stronger, the very considerable size of the pectorals, and by the coloration.

L. lütkenii has comparatively a very thickset and strongly built body; its height is contained not quite $6^{1}/_{2}$ times in the total length (a proportion met with in the largest specimen of *L. frigidus* alone, total length upwards of 500mm).

Head comparatively large, though the individual described is a female, equalling not quite $^{1}/_{4}$ of the total length. Snout slightly depressed; eyes rather small, being contained $9^{1}/_{2}$ times in the length of the head. Measured

udgjør Pandens Bredde $\frac{1}{16}$ af Hovedlængden, og dette Parti er saaledes forholdsvis bredt.

Overkjæven er kortere, end Hovedets halve Længde, og naar tilbage hen under Lindsens Bagrand.

I Totallængden indeholdes:

Hovedets Længde	3,89
Legemets største Højde	6,37
Snudens Afstand fra Dorsalen	3,33
Snudens Afstand fra Anus	2,11
Halens Længde	1,89

Af Tænder findes i Mellemkjæverne en længere Række af omtrent 15 paa hver Side, hvoraf de forreste ere de længste; hertil kommer en kortere Række i Spidsen bagenfor den første Række. Samtlige disse Tænder ere forholdsvis smaa, og blot de 2 allerforreste ere længere, end de øvrige. I Underkjæven, hvis tandbærende Del er længere, end den tilsvarende i Overkjæven, findes 12 længere og grovere Tænder, foruden et Antal finere Tænder foran disse i Spidsen. Palatinbenene bære fremdeles i en enkelt Række 15, Vomer 5 Tænder, der alle ere forholdsvis grove.

Finnerne. Dorsalen, som (fraregnet den halve Caudal) tæller 89 Straaler, begynder i en Afstand fra Snudespidsen, der indeholdes $3\frac{1}{5}$ Gange i Totallængden. Analen har paa samme Maade 71 Straaler; og da Caudalen har paa sin dorsale Side 6, paa den ventrale 5 Straaler, bliver det samlede Antal Straaler i Dorsalen 95, i Analen 76.

Pectoralerne ere overordentlig store og brede, og have paa begge Sider 23 Straaler. Udbredt optager Finnen en større Højde, end hele Legemshøjden og Dorsalhøjden tilsammen; fremslaaet naar den omtrent midt paa Øjet, tilbageslaaet i en Snudelængdes Afstand fra Anus. Dens Længde indeholdes i Totallængden blot ubetydeligt over $5\frac{1}{2}$ Gange. Straalerne ere i Spidsen særdeles brede.

Skjælbeklædning. Skjælbeklædningen mangler, foruden paa Hovedet og Finnerne, paa hele Bugen, samt langs Grunden af Analen indtil en halv Hovedlængde bag Anus; fremdeles er hele Nakken og Grunden langs Dorsalen omtrent indtil Verticalen fra Anus nøgen. Skjælbeklædningen strækker sig saaledes paa Legemets Midte frem indtil et Punkt under Pectoralens indre Trediedel. Skjællene ere forholdsvis ikke store. Finnerne ere nøgne; dog gaa paa Halens nedre Del enkelte Skjæl ud et kort Stykke over Finnernes Grund.

Sidelinien. Denne er mediolateral og enkelt, samt udspringer, som hos de øvrige Arter, over Gjællespalten; i en skraa Retning gaar den med et Antal af omtrent 11 tætstillede Porer ned til Legemets Midtlinie, som den følger til Halespidsen. Intet Spor af nogen lavere (ventral) Sidelinie kan opdages hos det foreliggende Individ; derimod strækker sig en Række af 10—12 Porer fra Gjællespaltens øvre Ende langs Ryggen, og slutter omtrent ved Legemets 3die mørke Felt.

Paa forskjellige af Hovedets Dele findes spredte Slimporer, tildels forsynede med en ophøjet Rand. Saale-

on the cranium, the interorbital space equals $\frac{1}{16}$ of the length of the head, and is therefore comparatively broad.

Upper jaw shorter than the head by one half, and extending backwards under the posterior margin of the lens.

The Total Length contains:—

The length of the head	3.89
The greatest height of the body	6.37
The distance of the snout from the dorsal	3.33
The distance of the snout from the vent	2.11
The length of the tail	1.89

The intermaxillaries are furnished with a row of 15 teeth on either side, the foremost being the longest; and a shorter series at the extremity, posterior to the first. All of these teeth are comparatively small, the two foremost only being somewhat longer than the rest. In the mandible, of which the part furnished with teeth is longer than the corresponding part in the upper jaw, occur 12 longer and stouter teeth, exclusive of a number of minute teeth anterior to them at the extremity. The palatine bones have 15 teeth, the vomer 5, all of which are rather strong.

Fins. — The dorsal, which, exclusive of half of the caudal, is furnished with 89 rays, commences at a distance from the point of the snout contained $3\frac{1}{5}$ times in the total length. The anal is furnished in like manner with 71 rays, and the caudal having on the dorsal side 6, on the ventral 5 rays, the total number of rays in the dorsal amounts to 95, in the anal to 76.

The pectorals are exceedingly large and broad, with 23 rays on either side; when spread out, their height exceeds that of the body and of the dorsal put together; the spread forwards reaches almost to the middle of the eye; backwards, within the length of the snout from the vent; its length compared to the total length slightly exceeds the proportion of 1 to $5\frac{1}{2}$; rays remarkably broad at the points.

Scales. — Scales wanting on the head, fins, the entire belly, and the base along the anal to within half the length of the head posterior to the vent; the whole of the nape, too, and the base along the dorsal, naked to a point perpendicular to the vent. Hence, the scaled integument extends along the middle of the body to a point opposite to the inner third of the pectorals. The scales are not large, comparatively. Fins naked; on the inferior portion of the tail, however, a few scales cross their base.

Lateral Line. — Single and medio-lateral, commencing, as in the other species, above the gill-opening; taking an oblique direction, it runs on to the mesial line of the body, accompanying it to the tip of the tail. There is no trace of a lower (ventral) lateral line in the specimen here described, but a series of 10 or 12 pores extends from the upper extremity of the gill-opening down along the back, terminating at about the third dark patch on the body.

On several parts of the head occur isolated mucous pores, some of them with an elevated margin. Thus, for

des staa paa Kinderne hen mod den øvre Rand af Operculum paa hver Side i en Triangel 3 Porer; bag Øjnene findes 2 mindre, og atter nedenfor disse 3 større Porer. En stor Pore aabner sig ved den nedre Vinkel af Operculum, ligesom den normale Række er tilstede langs Kjæverne.

Farve. Legemets Bundfarve er blegt graaagtig brun; under passende Belysning kan skimtes, men højst utydeligt, 6 mørkere Felter, der i Midten ere lysere, og have enkelte sorte Smaapletter, som danne en Tilnærmelse til de reticulerede Linier, der findes hos *L. reticulatus*. Tydeligst ere disse mørke Felter henad Dorsalen, hvor deres Rande ere næsten sorte, og skarpt markerede. Mellemrummet mellem Felterne er paa Legemet kun lidet lysere, end Felterne selv, men næsten renhvidt paa Dorsalen og Halespidsen.

Hovedet har ingen andre Tegninger, end et hvidt Baand, der strækker sig tvers over Nakken fra den ene Gjællespalte til den anden, og er begrændset af en utydelig sort Linie; iøvrigt er Hovedet blegt rødlig graat, noget lysere, end Kroppen, hvilket ogsaa er Tilfældet med Pectoralerne.

Føde, etc. Individet var en Hun, med umodne Æg i det eneste Ovarium. Ventrikelen, der var meget musculøs, indeholdt et noget fordøjet Individ af *Cottunculus microps*, Coll. (med en Totallængde af 110mm), samt Dele af en anden mindre Fisk, der var stærkere fordøjet, og ubestemmelig.

2 afrundede Udvidelser af Tarmen ved Pylorus kunne opfattes som et Par rudimentære Appendices pyloricae.

Udbredning. Det eneste hidtil bekjendte Exemplar af denne Art optoges fra betydeligt Dyb og iskoldt Vand i Havet nogle Mile vestenfor Nord-Spitsbergen, omtrent under 80° N. B.

Af den nærstaaende Art *L. reticulatus* findes, som ovenfor nævnt, udvoxede Individer fra Grønland i Musæet i Kjøbenhavn, samt et i Wiener-Musæet, alle erholdte i Aarene 1830—40. Af *L. perspicillum*, Kr., fra Grønland findes ligeledes et Individ i Musæet i Kjøbenhavn; af *L. rossi*, Malmgr., fra Spitsbergen opbevares det eneste Individ i Riks-Museum i Stockholm, og endelig findes Individet af *L. gracilis*, M. Sars, fra Christianiafjorden, i Universitets-Musæet i Christiania. Alle disse 3 sidstnævnte Arter maa, som ovenfor omhandlet, antages at udgjøre Ungdomsformerne af *L. reticulatus*, eller af *L. lütkenii* (eller af begge?).

instance, on the cheeks, near the upper margin of the operculum, a triangular figure is formed by pores, three in each of its sides; behind the eyes are two smaller ones, and below these pores three larger ones. A large pore occurs at the inferior angle of the operculum, and the normal series along the jaws is also present.

Colour. — The ground-colour of the body is a greyish-brown; in a good light, 6 dusky patches can be discerned, very indistinctly however; they are lighter in the middle, and marked with a few small black spots, an approximation to the network of lines in *L. reticulatus*. These dark patches show most distinct down the dorsal, their margins on that fin being almost black, and sharply defined. On the body, the space between the patches is very little lighter than are the patches themselves, but on the dorsal and the tip of the tail, it is nearly pure white.

The only marking on the head consists of a white band stretching across the nape, from one gill-opening to the other, and margined by an indistinct black line; the rest of the head is of a uniform pale reddish-grey, a shade lighter than the body, which is also the case with the pectorals.

Food, etc. — The individual here described was a female, with immature ova in its single ovary. The ventricle, which was very muscular, contained an example of *Cottunculus microps*, Coll., in a partially digested state (total length 110mm), together with parts of a smaller fish, which did not admit of being determined.

Two globular swellings of the intestine at the pylorus may be regarded as a pair of obtuse pyloric appendages.

Distribution. — The only example of this species as yet obtained was brought up from a considerable depth in the frigid area of the ocean, a few leagues west of the north coast of Spitzbergen, in lat. about 80° N.

Of its nearly related congener *L. reticulatus*, Reinh., full-grown specimens from Greenland are, as above stated, preserved in the Museum at Copenhagen and in the Vienna Museum, all of which were obtained in the decade from 1830 to 1840; of *L. perspicillum*, Kr., also from Greenland, there is, too, an example in the Museum at Copenhagen; of *L. rossi*, Malmgr., from Spitzbergen, the only specimen taken is preserved in the "Riks Museum" at Stockholm; and finally, the specimen of *L. gracilis*, M. Sars, from the Christiania Fjord, is in the Christiania University Museum. The three last-mentioned individuals must, as suggested above, be regarded as representing the early stages of development of *L. reticulatus*, or of *L. lütkenii* (or possibly of both).

21. Lycodes pallidus, Coll. 1878 (n. sp.)

Pl. III, Fig. 26—27.

Lycodes pallidus, Coll. Forh. Vid. Selsk. Chra. 1878, No. 14, p. 70 (1878).

Diagn. *Farven (hos yngre Individer) blegt graabrunt, med en Række (5—6) sorte Felter nedad Dorsalen, samt et enkelt, længere Felt af samme Farve paa Analen hen imod Spidsen. Skjællene forholdsvis store, og beklæde Legemet indtil henimod Pectoralernes Grund; Hovedet, Finnerne, samt Midten af Bugen ere nøgne. Legemets Højde indeholdes 9½ Gange, Hovedet næsten 4½ Gange i Totallængden (hos yngre Indiv.) Sidelinien enkelt, ventral, løber fra Gjællespaltens øvre Ende skraat nedad mod Anus. Størrelsen hos de foreliggende unge Individer indtil 164mm.*

M. B. 6. D. 98—101; A. 84—86; P. 18—19.

Localit. fra **Nordh. Exped.** Havet udenfor NV. Spitsbergen.

	Stat. 362.	*Stat.* 363.
Beliggenhed.	115 Kilom. V. Norskøerne, Spitsb.	60 Kilom. V. Norskøerne, Spitsb.
Dybde.	459 Favne (839 m).	260 Favne (475 m).
Temp. paa Bunden.	— 1,0° C.	+ 1,1° C.
Bunden.	Blaagraat Ler.	Blaaler.
Datum.	14de Aug. 1878.	14de Aug. 1878.
Antal Individ.	1 yngre Indiv.	1 Unge.

Udmaalinger.

	a. (*Stat.* 363).	*b.* (*Stat.* 362).
Totallængde	93mm	164mm
Længde til sidste Halehvirvel	90 -	161 -
Højde ved Begyndelsen af Dorsalen	10 -	17 -
Højde ved Begyndelsen af Analen	8,5 -	14 -
Snudespidsen til Begyndelsen af Dorsalen	25 -	46 -
Snudespidsen til Anus	37 -	64 -
Anus til Halespidsen (Halens Længde)	56 -	100 -
Hovedets Længde	21 -	37 -
Snudens Længde (til Begyndelsen af Iris)	7 -	13 -
Øjets Længde (Længde-Diameteren af Iris)	4 -	7 -
Hovedets postorbitale Del	10 -	17 -
Underkjævespidsens Afstand fra Ventralen	16 -	27 -
Ventralernes Afstand fra Anus	19 -	34 -
Ventralernes Længde	3 -	4 -
Pectoralernes Længde	13 -	16 -

Beskrivelse. *Legemsbygning.* I Legemsbygning, Sidelinie og Skjælbeklædning væsentlig overensstemmende med *L. frigidus*; dog ere Skjællene forholdsvis større, Pectoraler og Ventraler noget kortere, og Øjnene (især Lindsen) mindre, end hos denne Art. Som characteristisk for denne

21. Lycodes pallidus, Coll. 1878 (n. sp.)

Pl. III, Fig. 26—27.

Lycodes pallidus, Coll. Forh. Vid. Selsk. Chra. 1878, No. 14, p. 70 (1878).

Diagnosis. — *Colour (in young examples) pale greyish-brown, with a series (5—6) of black patches extending down the dorsal, and a patch of greater length, but similar in colour, near the extremity of the anal. Scales relatively large, covering the body almost to the base of the pectorals; the head, the fins, and the middle of the belly naked. The height of the body is to the total length (in immature individuals) as 1 to 9½; the length of the head, nearly as 1 to 4½. Lateral line single, ventral, passing from the upper extremity of the gill-opening obliquely downwards to the vent. The length in the specimens obtained reaching 164mm.*

M. B. 6. D. 98—101; A. 84—86; P. 18—19.

Locality (North Atl. Exped.): — The sea off NW. Spitzbergen.

	Stat. 362.	*Stat.* 363.
Exact Locality.	115 Kilom. W. Norskøer, Spitzb.	60 Kilom. W. Norskøer, Spitzb.
Depth.	459 Fathoms (839 m).	260 Fathoms (475 m).
Temp. at Bottom.	— 1.0° C.	+ 1.1° C.
Bottom.	Bluish-green Clay.	Blue Clay.
Date.	14th Aug. 1878.	14th Aug. 1878.
Numb. of Specim.	1 Indiv. (young).	1 Indiv. (young).

Measurements.

	a. (*Stat.* 363).	*b.* (*Stat.* 362).
Total length	93mm	164mm
Length to last caudal vertebra	90 -	161 -
Height at origin of dorsal	10 -	17 -
Height at origin of anal	8.5 -	14 -
From point of snout to origin of dorsal	25 -	46 -
From point of snout to vent	37 -	64 -
From vent to tip of tail (length of tail)	56 -	100 -
Length of head	21 -	37 -
Length of snout (to origin of iris)	7 -	13 -
Length of the eye (longit. diam. of iris)	4 -	7 -
Postorbital region of head	10 -	17 -
From extremity of mandible to ventrals	16 -	27 -
Distance of ventrals from vent	19 -	34 -
Length of ventrals	3 -	4 -
Length of pectorals	13 -	16 -

General Description. *Structure of the Body.* — In the structure of the body, the lateral line, and the scales closely agreeing with *L. frigidus*; the scales are however somewhat larger, the pectorals and ventrals somewhat shorter, and the eyes (particularly the lens) smaller than in

Arts Ydre kan endvidere nævnes den med sorte Felter forsynede Dorsal og Anal.

Legemet er, som hos alle de typiske Lycoder, omtrent jevnhøjt fra Nakken af og til forbi Anus, derfra afsmalnende, og efterhaanden løbende ud i en tilspidset Halespids; hele Halepartiet stærkt sammentrykt. Den største Højde (ved Begyndelsen af Dorsalen) indeholdes i Totallængden omtr. $9^1/_2$ Gange; ved Begyndelsen af Analen er Højden kun lidet aftaget, og indeholdes her lidt over 10 Gange i Totallængden. Afstanden fra Snudespidsen til Anus indeholdes $2^1/_2$ Gange, Halen $1^6/_{10}$ Gange i Totallængden.

Hovedet er temmelig fladtrykt, og indeholdes i Totallængden næsten $4^1/_2$ Gange. Overkjæven naar tilbage hen under Midten af Lindsen; hos det mindre Exemplar er Snuden noget stumpere og højere, Overkjæven er tillige noget kortere, og naar her blot hen under Lindsens Forrand.

De skaalformige Fordybninger langs Randen af Kjæverne ere særdeles fremtrædende, især hos det mindste Individ. Næseborene sidde temmelig nær ved Mellemkjæveranden, ere enkelte, og have, som hos de øvrige Arter, en lang hvidagtig Tube.

Øjnene ere forholdsvis mindre, end hos *L. frigidus*. Sammenlignes det største Individ af *L. pallidus* med et ligestort (ungt) Ind. af *L. frigidus*, sees Lindserne hos den sidste at være omtr. dobbelt saa store, som hos den første.

I Totallængden indeholdes	a. Totallængde 93mm	b. Totallængde 164mm
Hovedets Længde	4,42	4,43
Legemets Højde	9,30	9,64
Snudens Afstand fra Dorsalen	3,72	3,56
Snudens Afstand fra Anus	2,51	2,56
Halens Længde	1,66	1,64
Pectoralens Længde	7,15	10,25

Tænder ere tilstede i Mellemkjæverne, i Underkjæven, paa Vomer, og paa Palatinbenene, som hos de øvrige nordiske Lycoder. De ere forholdsvis stærke, stillede i Mellemkjæven fortil i 2, bagtil i 1 eller 2 Rækker; i Underkjæven danne de fortil flere Rækker. Da Individerne endnu ikke kunne antages at være fuldt udvoxede, har Antallet af Tænderne og disses Rækker maaske endnu ikke naaet sin fulde Udvikling.

Finnerne. Dorsalen, der hos det større Individ tæller omtrent 92, hos det mindre omtrent 95 Straaler, eller, sammenlagt end den halve Caudal, 98—101, begynder i en Afstand fra Snudespidsen, der indeholdes i Totallængden ikke fuldt 4 Gange.

Analen har hos det større Individ omtrent 79, hos det mindre omtrent 81 Straaler, hvilket sammen med Caudalens nedre Halvdel udgjør 84—86 Straaler. Straalerne ere hos de 2 undersøgte Individer vanskelige at tælle, hvor-

that species. As a conspicuous exterior feature characterising *L. pallidus*, may be mentioned the black patches on the dorsal and anal.

As in the typical *Lycodes*, the height of the body is very nearly uniform from the nape till past the vent, at which point the body gradually tapers, terminating in a pointed tail; the whole of the caudal region greatly compressed. Greatest height (at the origin of dorsal) is to the total length about as 1 to $9^1/_2$; at the origin of the anal the height is but little diminished, equalling rather more than $^1/_{10}$ of the total length. The distance from the point of the snout to the vent is to the total length as 1 to $2^1/_2$; the length of the head, as 1 to $1^6/_{10}$.

Head rather compressed; its length compared to the total length is nearly as 1 to $4^1/_2$. Upper jaw extending backwards under the middle of the lens; in the smaller specimen, the snout is somewhat more obtuse, and higher, the upper jaw not reaching further back than under the anterior margin of the lens.

The bowl-shaped depressions extending along the margin of the jaws are very distinct in the smaller specimen. Nostrils placed in close proximity to the margin of the inter-maxillary; they are single, and furnished with a whitish tube.

Eyes relatively smaller than in *L. frigidus*. On comparing the largest example of *L. pallidus* with a (young) specimen of equal size of *L. frigidus*, the lenses in the latter are found to be about twice as large as in the former.

The Total Length contains	a. Total Length 93mm	b. Total Length 164mm
The length of the head	4.42	4.43
The height of the body	9.30	9.64
The dist. of the snout from the dors.	3.72	3.56
The dist. of the snout from the anus	2.51	2.56
The length of the tail	1.66	1.64
The length of the pectorals	7.15	10.25

Teeth on the intermaxillaries, in the mandible, on the vomer, and on the palatine bones, as in the other northern species. They are comparatively strong, arranged on the intermaxillary anteriorly in 2, posteriorly in 1 or 2 series; in the mandible they constitute several series. The individuals having none of them, it is conceived, attained the adult stage of development, the number alike of the teeth and of their series is possibly not yet complete.

Fins. — The dorsal which, in the larger individual, is furnished with about 92, in the smaller with about 95 rays, or, including half the caudal, with 98 and 101 respectively, commences at a distance from the point of the snout not quite equal to one-fourth of the total length.

In the larger individual, the anal is furnished with about 79; in the smaller, with about 81 rays; or, including the lower half of the caudal, with 84 and 86 respectively. The rays in the two specimens examined cannot be accu-

for Antallet maaske i hver af Finnerne ere et Par flere eller færre.

Pectoralerne have hos det større Individ paa begge Sider 18, hos det mindre 19 Straaler, og ere forholdsvis korte, især hos det større Individ, hvor de fremlagte ere med sine Spidser fjernede mindst en Lindselængde fra Lindsen; hos det mindre Exemplar naa de derimod frem til Lindsens Bagrand. I Totallængden indeholdes de hos det yngste Individ kun lidt over 7, hos det ældre endog over 10 Gange i Totallængden. De nedre Straaler ere stærkt forkortede.

Ventralerne ere ligeledes forholdsvis kortere end hos de øvrige Arter, og synes at indeholde 2 yderst spinkle Straaler.

Skjælbeklædning. Næsten hele Legemet er skjælbeklædt; Hovedet, Nakken, Bugens Midte og Finnerne ere nøgne. Skjællene ere forholdsvis store, iøvrigt af Bygning, som hos de øvrige Lycoder. Fortil strækker Skjælbeklædningen sig frem mod Grunden af Pectoralerne; Bugen er derimod nøgen i Midten, men skjælbeklædt paa Siderne. Finnerne ere ligeledes nøgne, men der er ingen nøgen Rand langs deres Grundlinier; paa Hovedet og Nakken findes ingen Skjæl.

Det mindre Exemplar er ligesaa stærkt beklædt, som det større, og Skjællene strække sig her endog noget længere frem, eller umiddelbart til Pectoralernes Grund, ligesom der blot findes en smal Stribe langs Bugens Midtlinie, der ikke er skjælbeklædt.

Sidelinien er hos de forhaandenværende (yngre) Individer vanskelig at forfølge; dog er den utvivlsomt ventral, idet den udspringer ved Gjællespaltens øvre Ende, gjør en liden Bue over Gjællelaagets Flig, og gaar derpaa i skraa Retning, uden at have noget ret Parti, lige ned mod Anus; herfra er den paa begge de 2 Individer utydelig; men kan dog tildels øjnes som løbende langs Grunden af Analen ud mod Halespidsen. Porernes Antal indtil Anus er omtrent 34. Af nogen mediolateral Sidelinie kan ikke sees Spor.

Farven er paa selve Legemet blegt graabrun, uden Tegninger; Skjællene ere overalt lysere end Bundfarven, der under Lupen sees at have forholdsvis store og skarpt farvede Pigmentpunkter. Derimod ere Dorsalen og Analen paa hvidagtig Grund forsynede med en Række sorte Felter, der paa den førstnævnte Finne ere 5—6 i Antal. Det første af disse begynder umiddelbart ved Dorsalens første Straaler; de øvrige ere stillede med omtrent lige langt Mellemrum, som det, de selv optage, henad hele Finnens Længde. I Lighed med, hvad der finder Sted hos de med Tverbaand forsynede Lycoder, ere de dog noget forskjellige hos begge Individer; saaledes er det sidste Felt utydeligt hos det større Individ, hvorved dette faar en længere hvid Halespids, end det mindre. Analen har et enkelt, meget langt sort- eller sortagtigt Felt henimod Spidsen, men er forresten ensfarvet hvidagtig.

rately counted, and hence the true number in each of the fins may be greater or less by one or two rays.

The pectorals in the larger individual have on both sides 18, in the smaller 19 rays, and are comparatively short, more especially in the larger individual, the tips, when the fin is spread forwards, being removed at least the length of the lens from the lens; in the smaller individual they reach to its posterior margin. In the youngest specimen, the length of the pectorals compared to the total length slightly exceeds the proportion of 1 to 7; in the older example, of 1 to 10. The inferior rays are much shortened.

The ventrals, too, are relatively shorter than in any of the other species, and would seem to the composed of 2 rays.

Scales. — Almost the whole of the body in this species scaled; the head, the nape, the middle of the belly, and the fins naked. The scales are comparatively large, in other respects of the same structure as in the other species. Anteriorly, the scales extend towards the base of the pectorals; the belly, however, is naked in the middle, but scaled on the sides. Fins likewise naked, but there is no naked part along their basal lines; the head and nape are without scales.

The smaller example as extensively scaled as the larger, the scales reaching even somewhat farther in advance, or up to the base of the pectorals; indeed there is only a narrow strip along the mesial line of the belly that is scaleless.

The lateral line can with difficulty be traced throughout in these young individuals; it is, however, unquestionably ventral, commencing as it does at the upper extremity of the gill-opening, and passing from thence, after a slight bend above the gill-cover, straight down to the vent; here, in both specimens, it begins to be indistinct, but can however be distinguished, taking a course along the base of the anal to the extremity of the tail. Number of pores from origin to vent about 34. No trace of a medio-lateral line can be detected.

Colour on the body proper pale brownish-grey, with no markings whatever. The scales are everywhere of a lighter shade than the ground-colour, which, seen through a lens, appears dotted over with comparatively large and sharply defined pigmentary spots. The dorsal and anal are, on the contrary, distinguished by a series of black patches extending over a whitish ground, on the former fin 5 or 6 in number. The first of these blackish patches covers the first rays of the dorsal, the rest are arranged, with interspace about equal to their own breadth, down the whole extent of the fin. As is the case with the *Lycodes* that have transverse bands, they slightly differ, however, in the two individuals; thus, the last of the patches is indistinct in the larger specimen, giving greater length to the white termination of the tail. The anal has a solitary black or dusky elongated spot near its extremity; with this exception it is uniformly whitish.

Disse mørke Felter ere hos det mindre Exemplar kulsorte og skarpe, hos det større noget mindre tydelige og graasorte; de gaa lige ud til Randen af Finnerne, men ikke ud over Legemet, endskjønt der sees en næsten umærkelig mørk Skygning under hvert af dem. Hovedet har ingen Tegninger, undtagen forsaavidt, som Gjællelaagets Flig er ubetydeligt mørkere, end Hovedets øvrige Dele. Bughinden er hos det mindre Exemplar blaasort gjennemskinnende.

Det er sandsynligt, at den ovenfor beskreyne Farvetegning, der tilkommer de forholdsvis unge Individer, vil forandres, eftersom Individerne voxe til, og da sandsynligvis paa den Maade, at Dorsalens og Analens sorte Felter blive end mere utydelige.

Udbredelse. Hidtil foreligge blot de 2 under Nordhavs-Expeditionen ved Spitsbergens Nordkyst fundne unge Individer, der optoges fra 260—459 Favnes Dyb, og under en Temperatur paa Bunden, der i det ene Tilfælde var lidt over, i det andet lidt under 0° C.

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22. **Lycodes seminudus**, Reinh. 1838.

Pl. IV, Fig. 28.

Lycodes seminudus, Reinh. Kgl. D. Vid. Selsk. Naturv. Math. Afh. 7 Del, p. 221 (1838).

Diagn. *Farven i alle Aldre blegt graabrun, uden Pletter eller Baand. Skjælbeklædningen mangler paa Legemets forreste Parti omtrent indtil Verticalen fra Anus, samt paa Hovedet og Finnerne. Legemets Højde indeholdes hos et yngre Individ næsten* $8^1/_2$ *Gange i Totallængden, hos et ældre (Typ-Individet) 7 Gange i denne. Hovedet forholdsvis stort, dets Længde indeholdes hos yngre Individer 4 Gange (hos et ældre neppe* $3^1/_2$ *Gange) i Totallængden. Sidelinien medio-lateral, enkelt. Halepartiet og Pectoralerne forholdsvis korte. Appendices pyloricae 2 (Reinh.). Størrelsen indtil 450*mm.

M. B. 6. D. 91—92; A. 73—75; P. 19—22.

Localit. fra Nordh. Exped. Spitsbergen.

	Stat. 363.
Beliggenhed.	60 Kil. V. Norskøerne, Spitsbergen.
Dybde.	260 Favne (475m).
Temp. paa Bunden.	+ 1,1° C.
Bunden.	Bjaaler.
Datum.	14de Aug. 1878.
Antal Individer.	1 ungt Indiv.

In the smaller specimen, these dark patches are black and sharply defined; in the larger, less distinct and dusky. They extend to the margin of the fins, but do not encroach upon the body, though a scarcely perceptible clouding of a darker shade may be discerned under each of them. No markings on the head, save inasmuch as the flap of the gill-cover is a trifle darker than any other part of it. Ventral membrane in the smaller specimen translucent bluish-black.

It is probable that the coloration above described, characteristic of comparatively young individuals, will undergo a change as the course of development progresses, the black patches on the dorsal and anal becoming more and more indistinct.

Distribution. — The only individuals as yet met with, are the 2 young examples obtained on the North Atlantic Expedition off the northern shores of Spitzbergen, which were taken at a depth of 260 and 459 fathoms respectively, one in water a little below, the other in water a little above, the temperature of ice.

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22. **Lycodes seminudus**, Reinh. 1838.

Pl. IV, fig. 28.

Lycodes seminudus, Reinh. Kgl. D. Vid. Selsk. Naturv. Math. Afh. 7 Del, p. 221 (1838).

Diagnosis. — *Colour in all stages of development a pale greyish-brown, destitute of spots or bands. Scales wanting on the anterior part of the body to a perpendicular from the vent, as also on the head and the fins. The height of the body is to the total length in one young individual nearly as 1 to* $8^1/_2$*; in a maturer (typical) individual, as 1 to 7. Head comparatively large, its length in one young individual being to the total length as 1 to 4; in an older example the proportion was not quite as 1 to* $3^1/_2$*. Lateral line single, medio-lateral. Caudal region and pectorals comparatively short. Pyloric appendages 2 (Reinh.). Length reaching 450*mm.

M. B. 6. D. 91—92; A. 73—75; P. 19—22.

Locality (North Atl. Exped): — Spitzbergen.

	Stat. 363.
Exact Locality.	60 Kil. W. Norskøer, Spitzbergen.
Depth.	260 Fathoms (475m).
Temp. at Bottom.	+ 1.1° C.
Bottom.	Blue Clay.
Date.	14th Aug. 1878.
Numb. of Specim.	1 Indiv. (young).

Bemærkninger til Synonymien. Efterat denne Art i 1838 blev beskrevet af Reinhardt efter et (fuldvoxent?) Individ med en Totall. af 445mm fra Grønland, synes den ikke at have været gjenfunden; den er ikke senere bleven omtalt af nogen Forfatter efter Autopsi, idet Günther's og Gill's Diagnoser ere affattede efter Reinhardt's Beskrivelse. Det nye unge Individ fra Spitsbergen, der er udmærket vel vedligeholdt, stemmer, uagtet sin unge Alder, i alle væsentlige Dele overens med Reinhardt's Typ-Exemplar, som jeg i 1878 ved Dr. Lütken's Velvilje havde Lejlighed til at undersøge i Musæet i Kjøbenhavn; og de mindre væsentlige Afvigelser kunne neppe endnu begrunde nogen Artsdistinction mellem dem, saalænge blot disse 2 Individer foreligge. I sit Bidrag til Kundskaben om de grønlandske og islandske Lycoder i det zoologiske Musæum i Kjøbenhavn har Dr. Lütken (Vid. Medd. Nat. Foren. Kbhvn. 1880, p. 325) nærmere afhandlet Artens Characteristik (efter det foreliggende Typ-Exemplar), og paapeger der den store Overensstemmelse, der i det hele finder Sted mellem *L. seminudus* og *L. reticulatus.*

Udmaalinger.

Totallængde	128mm
Hovedets Længde	32 -
Legemets Højde over Beg. af Dorsalen	15 -
Legemets Højde over Beg. af Analen	12,5 -
Snudens Afstand fra Dorsalen	37 -
Snudens Afstand fra Anus	57 -
Halens Længde	71 -
Snudens Afstand fra Øjets forreste Rand	9 -
Lindsens Diameter	3,5 -
Øjets Længde (Diameter af Iris)	7 -
Afstanden fra Lindsen til Gjællelaagets Spidse	18 -
Afstanden mellem Lindserne	7 -
Hovedets Højde over Øjnene	11 -
Hovedets Bredde over Kinderne	15 -
Hovedets Højde lige bag Ventralerne	13,5 -
Afstanden fra Ventralerne til Anus	34 -
Pectoralernes største Længde	14 -
Pectoralspidsens Afstand fra Anus	14 -

Beskrivelse. *Legemsbygning.* De mest characteristiske Kjendemærker for denne Art er det blot halvt skjælbeklædte Legeme, i Forbindelse med dettes ensartede graabrune Farve uden Baand eller Pletter paa nogen af Legemets Dele, og den enkelte, medio-laterale Sidelinie.

Legemet er forholdsvis kort og noget bredt, med stort Hoved og stærkt sammentrykt Haleparti; det er temmelig jevnbredt indtil noget bagenfor Anus, men løber derfra ud i en hurtig tilspidset Spidse. Halen er relativt kort, idet den blot er en Pectoralfinnelængde længere, end det foran Anus liggende Parti af Legemet. Legemets Højde indeholdes omtr. $8^1/_2$ Gange i Totallængden, medens Typ-Exemplaret fra Grønland, der maaske var fuldt udvoxet, var forholdsvis kortere, idet Højden her blot indeholdtes 7 Gange i Totallængden.

Remarks on the Synonymy. — Since 1838, the year in which Reinhardt described this species, from an (adult?) individual — total length 445mm — taken on the coast of Greenland, no author has recorded it from autopsy, both Günther's and Gill's diagnoses having been compiled from Reinhardt's description. The new specimen, a young individual from Spitzbergen, exceedingly well preserved, agrees in all essential features with Reinhardt's typical example, which, in 1878, Dr. Lütken kindly afforded me an opportunity of examining in the Zoological Museum at Copenhagen; and the minor points of difference can hardly be deemed sufficient to warrant our assuming a specific distinction with only these two specimens before us. In his contributions to our knowledge of the Greenland and Iceland *Lycodes* preserved in the Zoological Museum at Copenhagen, Dr. Lütken (Vid. Medd. Nat. Foren. Kbhvn. 1880, p. 325) has treated of the species and its characteristics (from the typical specimen), and calls attention to the great general resemblance existing between *L. seminudus* and *L. reticulatus.*

Measurements.

Total length	128mm
Length of head	32 -
Height of the body above origin of dorsal	15 -
Height of the body above origin of anal	12.5 -
Distance of snout from dorsal	37 -
Distance of snout from vent	57 -
Length of the tail	71 -
Distance of snout from the anterior margin of the eye	9 -
Diameter of the lens	3.5 -
Length of the eye (diameter of iris)	7 -
Dist. from the lens to the extremity of the gill-cover	18 -
Distance between the lenses	7 -
Height of the head above the eyes	11 -
Breadth of the head across the cheeks	15 -
Height of the head immediately posterior to ventrals	13.5 -
Distance from ventrals to vent	34 -
Greatest length of pectorals	14 -
Distance from extremity of pectorals to vent	14 -

General Description. *Structure of the Body.* — The most salient characteristics of this species consist in one-half only of the body being scaled; in the uniform grey-brown colour, unmarked by bands or spots on any part of the body; and in the single, medio-lateral line.

Body comparatively short, and somewhat broad; head large, and the caudal region greatly compressed; the breadth of the body is nearly uniform till within a short distance posterior to the vent, from whence it gradually tapers, terminating in a pointed extremity. Tail comparatively short, being longer than the part of the body anterior to the vent by the length of the pectoral fin only. The height of the body is to the total length about as 1 to $8^1/_2$; but the typical specimen from Greenland, possibly an adult, was relatively shorter, the height equalling $^1/_7$ only of the total length.

Underkjæven er forholdsvis kun lidet kortere, end Overkjæven; Snuden er flad. Øjnene forholdsvis store, idet Diameteren af Iris næsten er lig Snudens Længde. Hovedet indeholdes i Totallængden præcis 4 Gange, medens Typ-Exemplaret, der var udvoxet, havde et større Hoved, der indeholdtes neppe $3^1/_2$ Gange i Totallængden. Spidsen af Gjællelaagets Flig er opadbøjet.

Næseborene bære temmelig lange Tuber, og sidde nær Kjæveranden.

Tænderne ere tilstede paa alle de hos de typiske Lycoder tandbærende Ben (Mellem- og Underkjæven, Palatinbenene, og Vomer). De ere forholdsvis ikke store, men talrige, og danne blot en enkelt Række, undtagen fortil i Underkjæven og paa Vomer, hvor de danne en dobbelt Række.

I Totallængden indeholdes:

Hovedets Længde	4,00
Legemets Højde	8,53
Snudens Afstand fra Dorsalen	3,45
Snudens Afstand fra Anus	2,24
Halens Længde	1,80
Pectoralens Længde	9,14

Finnerne. Dorsalen tæller hos det foreliggende unge Individ 86 Straaler, hvortil kommer Caudalens øvre Halvdel med omtr. 6 Straaler, tilsammen 92 Straaler. Analen havde 68 Straaler, eller, sammen med de 5 nedre Caudalstraaler, ialt 73 Straaler. Dorsalen udspringer i en Afstand fra Snudespidsen, der indeholdes i Totallængden ikke fuldt $3^1/_2$ Gange.

Pectoralerne ere særdeles korte, og tælle paa den ene Side 19, paa den anden 20 Straaler, hvis yderste Spidser ere fri; de nederste Straaler ere betydeligt kortere, end de øvrige. I Totallængden indeholdes de noget over 9 Gange; fremslaaede ere de fjernede omtrént en Øjendiameter fra Lindsen.

Hos Reinhardt's Typ-Exemplar havde Dorsalen 91, Analen (ifølge Dr. Lütken) 75 Straaler, Caudalen medregnet; fradrages dennes Halvdel paa hver Side (med 5 nedentil, og 6 oventil), fremkommer D. 85, A. 70, eller meget nær det samme Tal, som hos Individet fra Nordhavs-Expeditionen. Pectoralerne havde 21, paa den anden Side 22 Straaler, og vare saaledes noget flere, end hos Ungen fra Nordhavs-Expeditionen.

Skjælbeklædning. Ligesom hos Typ-Exemplaret, der maa antages at have været udvoxet, mangler hos den foreliggende Unge Skjælbeklædningen paa hele Legemets forreste Parti, ligesom paa Finnerne. Hele Halen er skjælbeklædt; fortil strækker Skjælbeklædningen sig frem i en Spidse, der naar ubetydeligt frem foran Verticalen fra Anus, medens Grunden langs Dorsalen og Analen er nøgen et godt Stykke bagenfor denne Linie. Skjællene ere forholdsvis smaa, størst paa det forreste Parti. Hos Typ-Exemplaret i Kjøbenhavn strækker Skjælbeklædningen sig knapt frem til Anus, saaledes at Forkroppens nøgne Parti her er noget større.

Sidelinie. Sidelinien, der er medio-lateral og enkelt, udspringer foran Spidsen af Gjællelaagets Flig, gjør en

Mandible but little shorter comparatively than the upper jaw; snout depressed, eyes rather large, the diameter of the iris nearly equalling the length of the snout. The head measures exactly one-fourth of the total length, whereas the typical specimen, a full-grown individual, had a larger head, which was contained not quite $3^1/_2$ times in the total length. Flap of gill-cover curving upwards.

Nostrils — placed near the margin of the jaw — provided with longish tubes.

Teeth on all the bones furnished with them in the typical *Lycodes* (the inter and inferior maxillaries, the palatine bones, and the vomer). They are not large comparatively, but numerous, and constitute a single series, except on the anterior part of the inferior maxillary and on the vomer, where they are arranged in a double row.

The Total Length contains: —

The length of the head	4,00
The height of the body	8.53
The distance of the snout from the dorsal	3.45
The distance of the snout from the vent	2.24
The length of the tail	1.80
The length of the pectorals	9.14

Fins. — The dorsal in the immature example obtained, is furnished with 86 rays, or, including the rays in the upper half of the caudal — about 6 — in all with 92. The anal had 68 rays, or, including the 5 lower caudal rays, in all 73. The dorsal commences at a distance from the point of the snout contained not quite three times and a half in the total length.

Pectorals exceedingly short, and furnished on one side with 19, on the other with 20 rays, the extreme points of which are free; the lowermost rays considerably shorter than the rest. The fin measures rather more than one-ninth of the total length; when spread forwards, they are removed an eye-diameter from the lens.

In Reinhardt's typical specimen, the dorsal had 91, the anal (according to Dr. Lütken) 75 rays, including the caudal: now, deducting on each side half of that fin (the lower part with 5, the upper with 6 rays), we get — D. 85; A. 70, or very nearly the same number as in the specimen from the North Atlantic Expedition. The pectorals had 21—22 rays, accordingly a somewhat greater number than in the young example taken on the Expedition.

Scales. — As in the typical specimen (most probably an adult), scales wanting in this young example on the whole of the anterior portion of the body, and on the fins. The tail scaled all over; anteriorly, the scaled integument extends forwards as an angle, to a point reaching but very little in advance of a perpendicular from the vent; the basal tract stretching along the dorsal and anal is naked for some distance posterior to that limit. Scales comparatively small, largest on the anterior part. In the typical specimen preserved at Copenhagen, the scales hardly reach to the vent, whereby greater length is given to the naked anterior part of the body.

Lateral Line. — Medio-lateral, single, originating immediately anterior to the extremity of the flap of the

kort Bue over denne, gaar derpaa i skraa Retning nedover indtil noget nedenfor Legemets Midtfure, men har omtrent ret over Anus atter naaet op til denne, og løber nu henad denne ud til Halespidsen. Indtil Anus er Antallet af Porer omtrent 35; paa Halens bagerste Parti ere Porerne temmelig utydelige.

En anden, næsten umærkelig Række Porer, der ere betydeligt mindre og mere fjerntstaaende, løber fra Gjællefligen bagover noget ovenfor Legemets Midtlinie. Antallet af Porer i denne (dorsale) Sidelinie er indtil Anus blot 7 (Reinhardt fandt hos Typ-Exemplaret 11 i denne Linie); senere tabe de sig mellem Skjællene. Ogsaa hos enkelte andre Arter har jeg kunnet se Spor af denne supralaterale Sidelinie, men paa Grund af Skjælbeklædningens større Udstrækning hos disse mindre tydeligt; sandsynligvis maa den opfattes som en Fortsættelse af Hovedets Slimpore-Net, men ikke som nogen egentlig Sidelinie.

Paa Gjællelaaget løber endvidere i en Halvkreds en Række Porer, ligesom en kort Række løber tvers over Snudespidsen lige ved Randen.

Farven. Farven er ensartet hvidagtig graabrun, uden Pletter og Baand. En utydelig mørkere Stribe løber langs henad Midtlinien, en anden langs den bagre Del af Dorsalens Grund. Paa Hovedet er der et mørkt Parti paa Gjællelaaget hen mod Spidsen. Pectoralerne ere hvidagtige, ligesom Analen og Hovedets Underside; Bugen blaasort, Randene omkring Anus hvide. Skjællene ere ligeledes lysere, end Bundfarven.

Udbredelse. Af denne Art har hidtil blot været omtalt det ene, Typ-Exemplaret, nedsendt til Musæet i Kjøbenhavn fra Omenak (Umanak) i Grønland i 1837. Dets Totallængde var omtrent 449 mm, hvoraf Hovedets Længde var 123 mm. Det nye Individ fra Spitsbergens Nordkyst er, som ovenfor nævnt, en Unge, der optoges fra den tempererede Area (Bundtemperatur + 1,1° C.) fra Lerbund i August 1878.

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23. **Lycodes muraena**, Coll. 1878 (n. sp.).

Pl. IV, Fig. 29—31.

Lycodes muraena, Coll. Forh. Vid. Selsk. Chrå. 1878, No. 4, p. 15; No. 14, p. 74 (1878).

Diagn. *Særdeles langstrakt. Farven ensartet graabrun. Skjælbeklædningen sildigt og uregelmæssigt fremtrædende; Skjællene i fuldt udviklet Stand udbredte over hele Legemet, medens Hovedet og Nakken, samt Finnerne ere nøgne. Tænderne forholdsvis stærke; Rækken paa Palatinbenene særdeles kort. Legemets Højde indeholdes 20—22½ Gange i Totallængden. Hovedet er fladt med opadvendte*

gill-cover, above which it makes an abrupt bend, passing from thence obliquely downwards till a little *below* the mesial furrow of the body, but reaching it again at a point almost straight above the vent, and running along it to the tip of the tail. Number of pores from origin to vent about 35; they are indistinct on the posterior portion of the tail.

Another, almost imperceptible series of pores, considerably smaller and farther apart, extends from the branchial flap backwards, somewhat above the mesial line of the body. Number of pores in this (dorsal) line only 7 from origin to vent (Reinhardt counted 11 in his typical specimen); the remainder cannot be distinguished among the scales. In one or two other species I have also found traces of this supra-lateral line, but less distinct, owing to the greater extent of the scaled integument; probably, however, it must be regarded as a continuation of the mucous pores of the head, and not strictly as a lateral line.

On the operculum, too, occurs a semicircular series of pores, and a short series extends straight across the point of the snout, close to the margin.

Colour. — A uniform whity greyish-brown, without spots or bands. An indistinct dusky stripe extends along the mesial line, and another along the posterior portion of the base of the dorsal. On the head, there is a dark patch, near the extremity of the gill-plate. Pectorals whitish, as also the anal and the under surface of the head; belly bluish-black, margin of vent white. The scales are lighter than the ground-colour.

Distribution. — The only individual of this species ever recorded, is the typical specimen sent to the Zoological Museum at Copenhagen, from Omenak (Umanak), in Greenland, 1837. Its total length is about 449 mm; the length of the head 123 mm. The new specimen from the north coast of Spitzbergen — a young individual — was, as mentioned above, taken in the temperate area (temperature at bottom + 1.1° C.) on a clay bottom, in August 1878.

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23. **Lycodes muræna,** Coll. 1878 (n. sp.).

Pl. IV, fig. 29—31.

Lycodes muræna, Coll. Forh. Vid. Selsk. Chra. 1878, No. 4, p. 15, No. 14, p. 74 (1878).

Diagnosis. — *Exceedingly elongate. Colour a uniform greyish-brown. The scales (they develop late and irregularly) cover in the fully developed stage the whole of the body, whereas the head, the nape, and the fins are naked. Teeth comparatively strong; the series on the palatine bones exceedingly short. The height of the body is to the total length as 1 to 20—22½. Head depressed, with the eyes turned*

Øjne, og indeholdes i Totallængden 8, hos Ungerne 7 Gange. Gjællehindens Straaler 5. Sidelinien ventral, gaar fra Gjællespaltens øvre Ende skraat ned mod Anus, derfra langs Grunden af Analen ud mod Caudalen. Størrelsen (hos de foreliggende yngre Individer) indtil 217mm.

M. B. 5. D. 101—118; A. 97—103; P. 13—17.

Localit. fra Nordh. Exped. Bankerne udenfor Helgeland i Norge; Havet udenfor Beeren Eiland og Spitsbergen.

	Stat. 124.	*Stat.* 312.	*Stat.* 362.
Beliggenhed.	325 Kil. VSV. Bodø, Norge.	108 Kil. V. Beeren Eiland.	115 Kilom. V. Norskøerne, Sptb.
Dybde.	350 Favne (640m).	658 Favne (1203m).	459 Favne (839m).
Temp. paa Bunden.	— 0.9° C.	— 1.2° C.	— 1.0° C.
Bunden.	Ler.	Brunt og grønt Ler.	Blaagraat Ler.
Datum.	19de Juni 1877.	22de Juli 1878.	14de Aug. 1878.
Antal Individer.	1 Indiv.	1 spæd Unge.	2 Indiv.

upwards; its length is one-eighth of the total length, in young individuals one-seventh. Branchiostegals 5. Lateral line ventral, descending from the upper extremity of the gill-opening obliquely to the vent, and from thence passing along the base of the anal to the caudal. Length (in the young specimens) reaching 217mm.

M. B. 5. D. 101—118; A. 97—103; P. 13—17.

Locality (North Atl. Exped.): — Banks lying off Helgeland, in Norway; the open sea, off Beeren Eiland and Spitzbergen.

	Stat. 124.	*Stat.* 312.	*Stat.* 362.
Exact Locality.	325 Kil. W. Bodø, Norway.	108 Kil. W. Beeren Eiland.	115 Kil. W. of Norskøer, Spitzb.
Depth.	350 Fathoms (640m).	658 Fathoms (1203m).	459 Fathoms (839m).
Temp. at Bottom.	— 0.9° C.	— 1.2° C.	— 1.0° C.
Bottom.	Clay.	Brown and green Clay.	Bluish-grey Clay.
Date.	19th June 1877.	22th July 1878.	14th Aug. 1878.
Numb. of Specim.	1 Indiv.	1 Ind. (very young).	2 Indiv.

Bemærkninger til Synonymien. Ved sin særdeles langstrakte Legemsbygning, i hvilken Henseende den næsten overgaar selv de større Individer af *Lumpenus*-Arterne, afviger den betydeligt fra de øvrige i denne Afhandling omhandlede Lycoder. 3 andre Arter have imidlertid tilnærmelsesvis den samme langstrakte Legemsbygning, nemlig *L. sarsii*, Coll. 1871, fra Hardangerfjorden i Norge (Forh. Vid. Selsk. Chra. 1871, p. 62), *L. verrillii*, Goode & Bean 1877, fra Nova Scotia, Nord-America (Dana and Silliman, Am. Journ. Sci. Arts. 3 Ser. vol. 14, p. 470, Dec. 1877), samt *L. paxillus*, Goode & Bean 1879, ligeledes fra Nova Scotia (Proc. U. S. Nat. Mus. vol. II, p. 44, 1879). Der bliver saaledes et Spørgsmaal, om nogen af alle disse Arter falder sammen.

L. sarsii er beskreven efter en Unge med en Totallængde af blot 43mm, optagen fra 100—150 Favnes Dyb i Hardangerfjorden i Sept. 1869. Endskjønt denne ved sit

Remarks on the Synonymy. — The remarkably elongated form of the body, in which respect it almost surpasses the largest individuals of the *Lumpenus* species, is a feature essentially distinguishing it from the other Lycods described in this Report. Three other species, however, have approximately a similar structure of body, viz. *L. sarsii*, Coll. 1871, from the Hardangerfjord, Norway (Forh. Vid. Selsk. Chra. 1871, p. 62); *L. verrillii*, Goode & Bean 1877, from Nova Scotia, North America (Dana and Silliman, Am. Journ. Sci. Arts, 3 Ser. vol. 14, p. 470, Dec. 1877); and *L. paxillus*, Goode & Bean 1879, likewise from Nova Scotia (Proc. U. S. Nat. Mus. vol. II, p. 44, 1879): hence the question arises, are any of these species identical.

L. sarsii is described from a young specimen, total length only 43mm, taken at a depth of 100—150 fathoms in the Hardanger Fjord, Norway, in Sept. 1869. Though

Lycodes sarsii, Coll. Hardanger-Fjord, Norge (1/1).

Udseende tydelig bærer Præget af at være en Unge, kan den ikke være identisk med *L. muraena*, dels paa Grund af de temmelig afvigende Legemsforholde, som det vil fremgaa af nedenstaaende Sammenligning mellem begge Arter, dels fordi *L. sarsii*, skjønt en Unge, dog øjensynlig er langt videre udviklet, end den mindste foreliggende Unge af *L. muraena*, hvis Totall. er 112mm. Legemet er nemlig hos *L. sarsii* fuldstændig pigmenteret, som hos udvoxede Lycoder, medens den 2 til 3 Gange større Unge af *L. muraena* endnu er halvt transparent, og Legemet næsten uden Pigment. Sandsynligvis udgjør *L. sarsii* Ungen af en i sin udvoxede Tilstand endnu ukjendt Art, der paa Grund af den foreliggende Unges forholdsvis langt fremskredne Ud-

its general appearance plainly shows this specimen to have been a young individual, it cannot be identical with *L. muræna*, partly by reason of its differing not immaterially in the proportions of the body (as will appear from the comparison given below of the two species), and partly from the fact of the specimen of *L. sarsii*, though a young individual, having attained a far more advanced stage of development than the smallest of the young specimens of *L. muræna*, with a total length of 112mm. In *L. sarsii*, the coloration of the body is complete, as in full-grown Lycods, whereas the young specimen of *L. muræna*, of from double to treble its dimensions, was still semi-translucent, and the body almost without a trace of pigment. Probably *L. sarsii* is

vikling utvivlsomt maa antages at være en af de anguilliforme Arter.

L. verrillii er opstillet efter 5 Individer, hvoraf det beskrevne Typ-Exemplar havde en Længde af 5 eng. Tommer (omtrent 127 mm), og som vare optagne i August 1877 fra 90—100 Favnes Dyb udenfor Kysterne af Nova Scotia i Nord-America. Fra *L. muraena* afviger *L. verrillii*, for-

a young individual of a species as yet unknown in the adult stage, which, judging from its advanced development, must unquestionably belong to the anguilliform species.

L. verrillii is described from 5 individuals: the typical specimen, with a total length of 5 inches (about 127 mm), was taken in August, 1877, at a depth of from 90 to 100 fathoms, off the coast of Nova Scotia, North America. *L. verrillii* differs from *L. muræna* in having 6

L. verrillii, Goode & Bean. Nova Scotia (½).

uden ved sine 6 Gjællestraaler, tillige ved sit med mørke Tverfelter forsynede Legeme, saavel som ved bestemte Forskjelligheder i Legemsbygningen, saaledes et større Hoved, stærkere Tænder, og større Legemshøjde; med denne Art kan *L. muraena* aldrig falde sammen. Da jeg ved Professor Spencer Baird's Velvillie har erholdt et authentisk Exemplar af *L. verrillii*, har jeg kunnet anstille en fuldkommen afgjørende Sammenligning mellem begge de omhandlede Arter.

Af *L. paxillus* foreligger blot et enkelt Individ med en Totallængde af 363 mm, optaget i mindre vel vedligeholdt Stand (maaske fra en Fiskemave) udenfor Kysterne af Nova Scotia i 1879. Ifølge den af Forfatterne givne Beskrivelse er Arten kjendelig ved de overordentlig stærkt udviklede Kjævemuskler, der give det næsten Udseendet af en Giftslanges; Legemets største Højde indeholdes over 16 Gange i Totallængden. Kjæverne ere ejendommeligt krummede mod hinanden; blandt de øvrige Uoverensstemmelser mellem begge Arter kunne nævnes de langt kortere Pectoraler hos *L. paxillus*.

Af Totall. udgjør. . .	*L. muraena*, jun. Totall. 112 mm	*L. muraena*. Totall. 217 mm	*L. sarsii*, jun. Totall. 43 mm	*L. verrillii*. Totall. 115 mm	*L. paxillus*. Totall. 363 mm
Hovedets Længde .	7,00	8,34	5,97	5,77	—
Legemets største Højde	22,40	21,70	14,33	12,70	over 16,00
Snudens Afstand fra Dorsalen . . .	5,09	5,56	3,90	3,84	—
Snudens Afstand fra Ventralerne .	8,61	10,85	6,61	6,04	—
Snudens Afstand fra Anus	3,73	4,01	3,07	3,09	—

Da Legemsproportionerne hos *L. verrillii* og *L. sarsii* synes at være temmelig overensstemmende, kunde det tænkes, at disse Arter vare identiske. For Øjeblikket, saalænge som de mellemliggende Stadier mangle, lader den sidstnævnte sig med Lethed skille fra *L. sarsii* bl. a. ved sine mørke Tverfelter ud over Legemet, og ved de stærkere Tænder.

Det kan ligeledes nævnes, at Dr. Lütken i sin oven-

branchiostegals, and the body flecked with dark transverse patches; also by reason of differences in its general structure, viz. a larger head, stronger teeth, and greater depth of body: hence *L. muræna* cannot possibly agree with this species. Professor Spencer Baird having kindly sent me an authentic example of *L. verrillii*, I have had the means of instituting a direct and conclusive comparison between the two species.

Of *L. paxillus*, but one individual has as yet been obtained, total length 363 mm; it was met with, in rather a mutilated condition (having possibly been taken from a fish's stomach), off the coast of Nova Scotia, in 1879. According to the description given of the species, it may be recognised by the remarkable development of the maxillary muscles, giving them almost the appearance of a venomous serpent's. Greatest height of the body slightly exceeding one-sixteenth of the total length; the jaws incurvating towards each other. Amongst other distinctive features in *L. paxillus*, may be mentioned the shortness of the pectorals.

The Total L. contains.	*L. muræna*, jun. Total L. 112 mm	*L. muræna*. Total L. 217 mm	*L. sarsii*, jun. Total L. 43 mm	*L. verrillii*. Total L. 115 mm	*L. paxillus*. Total L. 363 mm
The L. of the head	7.00	8.34	5.97	5.77	—
The greatest height of the body . . .	22.40	21.70	14.33	12.70	upwards of 16.00
The dist. of the snout from the dorsal . .	5.09	5.56	3.90	3.84	—
The dist. of the snout from the ventrals .	8.61	10.85	6.61	6.04	—
The dist. of the snout from the vent . . .	3.73	4.01	3.07	3.09	—

The dimensions of the body in *L. verrillii* and *L. sarsii* agreeing, it appears, so closely, these two species might by some be regarded as identical. But, till specimens in the intermedial stages of development shall have been discovered, the former may be readily distinguished from *L. sarsii* by the dark transverse spots on the body, and by the strong teeth.

It may likewise be observed, that Dr. Lütken, in the

for ofte berørte Afhandling om de grønlandske og islandske Lycoder angiver som en Mulighed, at *L. verrillii* udgjør et yngre Trin af *L. vahlii*, eller en anden nærstaaende Form. Til denne Anskuelse har nærværende Forfatter vanskeligt for at slutte sig paa Grund af den udprægede anguilliforme Habitus, der udmærker *L. verrillii*, medens *L. vahlii* hører til de typiske Former, hvis Unger maa have den samme relativt betydelige Legemshøjde, som f. Ex. *L. frigidus* og *L. esmarkii* have i Unge-Stadiet.

Udmaalinger.	a. Stat. 312.	b. Stat. 124.	c. Han. Stat. 362.	d. Hun. Stat. 362.
Totallængde	112mm	141mm	198mm	217mm
Hovedets Længde	16 -	18 -	25 -	26 -
Legemets Højde over Begyndelsen af Dorsalen	5 -	7 -	9 -	10 -
Legemets Højde over Begyndelsen af Analen	3,5 -	6 -	8 -	7,5 -
Snudens Afstand fra Dorsalen	22 -	24 -	41 -	39 -
Snudens Afstand fra Anus	30 -	39 -	55 -	54 -
Halens Længde (Anus' Afstand fra Halespidsen)	82 -	112 -	143 -	163 -
Snudens Afstand fra Øjet	5 -	5 -	8 -	9 -
Øjets Diameter (Længden af Iris)	3,5 -	4 -	5 -	5 -
Afstanden fra Lindsen til Gjællelaagets Spidse	7,5 -	9 -	12 -	12 -
Afstanden mellem Lindserne	2,5 -	3 -	3,8 -	4 -
Hovedets Højde over Øjnene	4,5 -	6 -	8,5 -	8 -
Hovedets Bredde over Kinderne	8 -	8,5 -	14 -	12 -
Hovedets Højde lige bag Ventralerne	5 -	7 -	9,5 -	9,5 -
Afstanden fra Ventralerne til Anus	17 -	25 -	33 -	33 -
Pectoralens største Længde	10 -	12 -	17,5 -	18 -

Beskrivelse. *Legemsbygning.* Legemet er overordentlig langstrakt og smalt, alene over Hovedet og Bugen trindere, men forresten stærkt sammentrykt fra Siderne. Da Anus er forholdsmæssig langt fremrykket, er det hovedsagelig Halen, der har faaet denne betydelige Længde.

Idethele er *L. muraena* den mest langstrakte af alle hidtil kjendte Arter. Legemets største Højde ved Begyndelsen af Dorsalen indeholdes, saavel hos Ungen, som de større Exemplarer 20—22½ Gange i Totallængden; denne Højde aftager yderligere lige over Anus, og paa Midten af Halen er Forholdet omtrent, som 1 til 36—40.

Hovedet er stort i Forhold til Legemshøjden, paafaldende fladtrykt, og fortil temmelig bredt, med særdeles tykke og fremfaldende Læber; dets Bredde over Kinderne er ikke synderlig større, end over Snuden, men dog betydelig større, end dets største Højde. Overkjæven rager betydeligt frem over Underkjæven. Hovedet indeholdes i Totallængden hos et Yngel-Individ 7, hos det største Individ næsten 8,4 Gange i Totallængden.

Øjnene ere, paa Grund af det fladtrykte Hoved, næsten ganske opadvendte; deres Længdediameter er, som hos de

memoir frequently alluded to above, on the Greenland and Iceland Lycods, states that *L. verrillii* possibly represents an immature stage of *L. vahlii* or some other closely allied species. This view, however, I can hardly myself share, *L. verrillii* being so decidedly anguilliform in its habitus, whereas *L. vahlii* belongs to the typical forms, the young of which must certainly be characterised by a height of body as considerable, for instance, as that of *L. frigidus* and *L. esmarkii* in the earlier stages of growth.

Measurements.	a. Stat. 312.	b. Stat. 124.	c. Male. Stat. 362.	d. Fem. Stat. 362.
Total length	112mm	141mm	198mm	217mm
Length of the head	16 -	18 -	25 -	26 -
Height of the body above origin of dorsal	5 -	7 -	9 -	10 -
Height of the body above origin of anal	3.5 -	6 -	8 -	7.5 -
Distance of snout from dorsal	22 -	24 -	41 -	39 -
Distance of snout from vent	30 -	39 -	55 -	54 -
Length of the tail (distance of vent from tip of tail)	82 -	112 -	143 -	163 -
Dist. of the snout from the eye	5 -	5 -	8 -	9 -
Diameter of the eye (length of iris)	3.5 -	4 -	5 -	5 -
Distance from the lens to the extremity of the opercle	7.5 -	9 -	12 -	12 -
Distance between the lenses	2.5 -	3 -	3.8 -	4 -
Height of head above the eyes	4.5 -	6 -	8.5 -	8 -
Breadth of head across the cheeks	8 -	8.5 -	14 -	12 -
Height of the head immediately posterior to the ventrals	5 -	7 -	9.5 -	9.5 -
Distance from ventrals to vent	17 -	25 -	33 -	33 -
Greatest length of pectorals	10 -	12 -	17.5 -	18 -

Description. *Structure of the Body.* — The body is exceedingly narrow and elongated, a trifle rounder across the head and belly only; at the sides very much compressed. The vent being far in advance, it is more especially the tail that exhibits this very considerable elongation.

L. muræna is the most elongate in form of all the species yet known. The greatest height of the body at the origin of the dorsal, alike in the very young specimen and the maturer examples, is to the total length as 1 to 20—22.5; nay, even this height diminishes immediately above the vent, the proportion in the middle of the tail being about as 1 to 36—40.

The head large compared to the height of the body, remarkably depressed, and rather broad anteriorly, with very thick and prociduous lips; its breadth across the cheeks not much greater than across the snout, though greatly exceeding its extreme height. The upper jaw considerably overlapping the lower. The length of the head in the fry-specimen is to the total length as 1 to 7; in the largest example, as 1 to 8.4.

The eyes, owing to the depressed form of the body, directed almost straight upwards; their longitudinal diameter

øvrige Arter, større, end deres Højde, og indeholdes $4^{1}/_{2}$—5 Gange i Hovedlængden. Interorbitalrummet er ganske smalt, men Lindserne store.

Næseborene ere enkelte og rørformige; Tubens Længde er næsten lig en halv Lindsediameter.

Gjællestraalerne ere hos denne Art blot 5. i Antal. Pseudobranchier ere tilstede; Gjællerne ere normale.

Tænderne, der ikke mangle paa noget af de regulært tandbærende Ben, ere forholdsvis lange og noget cylindriske, (dog kortere, end hos *L. verrillii*). I Mellemkjæven danne de en enkelt Række af omtrent 10 Tænder paa hver Side; i Underkjæven findes hos de mindre Exemplarer blot en enkelt, hos de større flere Rækker. Mindre Tandsamlinger findes paa Vomer og paa Palatinbenene. Rækken paa det sidstnævnte Ben er særdeles kort.

De langs Over- og Underkjæven optrædende store og aabne Porer ere hos ingen anden Art saa distincte, som hos denne (maaske, fordi disse Individer samtlige ere forholdsvis ganske unge). Især ere de 5 langs Overkjæven, og de 6 langs Underkjæven særdeles dybe, og sidde i brede, skaalformige Fordybninger, svarende til Caviteterne i Infraorbitalbenene og i Underkjæven. Paa Hovedets Overside, paa Gjællelaagene, samt paa Nakken findes et stort Antal enkeltstaaende, eller i kortere Rækker fordelte smaa Slimporer; enkelte af disse kunne sees at ende i særdeles korte Tuber.

I Totallængden indeholdes	a. Totall. 112mm	b. Totall. 141mm	c. Totall. 198mm	d. Totall. 217mm
Hovedets Længde . . .	7,00	7,83	7,92	8,34
Legemets Højde ved Beg. af Dorsalen . .	22,40	20,14	22,00	21,70
Legemets Højde ved Beg. af Analen . . .	32,00	23,50	24,75	29,05
Snudens Afstand fra Dorsalen	5,09	5,87	4,82	5,56
Snudens Afstand fra Anus	3,73	3,61	3,60	4,01
Halens Længde (Anus til Halespidsen) . . .	1,36	1,25	1,38	1,33

Anus er længere fremrykket, end hos nogen af de øvrige Lycoder, eller med andre Ord, Halepartiet er usædvanligt langt, og udgjør omkring $^{3}/_{4}$ af Totallængden.

Finnerne. Straaleantallet synes hos denne Art at være særdeles lidet constant, ligesom det Punkt, hvor Dorsalen tager sin Begyndelse, kan være forholdsvis længere fremrykket hos et Indidid, end hos et andet.

Antallet af Straaler var hos de 4 foreliggende Individer følgende (i de verticale Finner ere Caudalstraalerne medregnede):

	a. Totall. 112mm	b. Totall. 141mm	c. Totall. 198mm	d. Totall. 218mm
Dorsalen	101	118	104	108
Analen	97	100	98	103
Pectoralerne	13—14	13—13	17—17	15—16

both in this and in the other species, is greater than the vertical, and compared to the length of the head, as 1 to $4^{1}/_{2}$—5. Interorbital space narrow; lenses large.

Nostrils single and tubular. The length of the tube almost equal to half the diameter of the lens.

Branchiostegals in this species 5 only. Pseudobranchiæ present; gills normal.

The teeth, wanting on none of the bones regularly furnished with them, are comparatively long (shorter, however, than in *L. verrillii*), and somewhat cylindrical. On the intermaxillary, they constitute a single series of about 10 teeth on each side; in the lower jaw, the smaller examples have only a single row, the larger several series. Small patches of teeth occur on the vomer and the palatine bones; the series on the latter is exceedingly short.

The large pores disposed along the upper and lower jaws are in none of the other species so distinct as in this (possibly from the specimens being all of them relatively young individuals). The 5 extending along the upper jaw, and the 6 along the lower, are in particular exceedingly deep, occupying broad, bowl-shaped depressions corresponding with the cavities in the infraorbital bones and in the lower jaw. On the upper surface of the head, on the opercles, and on the nape, are a large number of small mucous pores, either isolated or arranged in short rows, part of them terminating in exceedingly short tubes.

The Total Length contains	a. Total L. 112mm	b. Total L. 141mm	c. Total L. 198mm	d. Total L. 217mm
The length of the head	7.00	7.83	7.92	8.34
The height of the body at origin of dorsal .	22.40	20.14	22.00	21.70
The height of the body at origin of anal . .	32.00	23.50	24.75	29.05
The dist. of the snout from the dorsal . . .	5.09	5.87	4.82	5.56
The dist. of the snout from the vent	3.73	3.61	3.60	4.01
The length of tail (from vent to tip of tail) .	1.36	1.25	1.38	1.33

The vent is farther in advance than in any of the other Lycods; hence the caudal region is exceptionally long, well nigh three-fourths of the total length.

Fins. — The number of fin-rays in this species would appear to be anything but constant; the point, too, at which the dorsal commences, lies farther in advance in some individuals than in others.

The fin-ray formula in the 4 specimens examined was as follows (caudal rays included in the vertical fins): —

	a. Total L. 112mm	b. Total L. 141mm	c. Total L. 198mm	d. Total L. 218mm
Dorsal	101	118	104	108
Anal	97	100	98	103
Pectorals	13—14	13—13	17—17	15—16

Dorsalstraalerne varierede saaledes i Antal fra 101—118; fradrages den øvre Halvdel af Caudalen med 6 Straaler, bliver den hele Række 95—112, et Straaleantal, som blot de ældre Individer af *L. vahlii* og *L. esmarkii* have opnaaet. Hos et af Individerne (*b*) ligger Dorsalens Begyndelse betydeligt nærmere hen mod Nakken, end hos de andre. Dorsalens største Højde er omtrent lig $^1/_3$ af Legemshøjden; dog er Straalernes virkelige Længde, paa Grund af deres skraa Stilling, noget større, eller omtrent lig Legemets halve Højde, men de kunne neppe nogensinde rejses til sin fulde Højde.

Analens Straaler variere i Antal fra 97—103; fradrages den nedre Halvdel af Caudalen, der sandsynligvis tæller 5 Straaler, bliver Rækken 92—98, et Antal, som hidtil ikke er fundet hos nogen anden Art.

Pectoralerne ere forholdsvis lange og slanke, noget tilspidsede, og have faa Straaler, idet Antallet har vist sig at variere mellem 13 og 17.

Ventralerne ere ligeledes temmelig lange (dog kortere, end Øjets Længdediameter), og indeholdes i Hovedlængden 6—$6^1/_2$ Gange. Straaleantallet kan ikke med Sikkerhed opgives.

Skjælbeklædning. I én Henseende frembød Skjælbeklædningen hos Individerne af denne Art en højst mærkelig Variation, nemlig med Hensyn til det Tidspunct, da denne begynder at udvikle sig under Individernes Væxt. Typ-Exemplaret af denne Art, beskrevet i den første af de foreløbige Beretninger om Nordhavs-Expeditionens Fiske, og som havde en Totall. af 141^{mm}, havde tæt Skjælbeklædning paa hele Legemet, medens Hovedet med Nakken, samt Finnerne vare nøgne. Af de 3 nyerholdte Exemplarer fra 1878 havde den ene, en spæd Unge, intet Spor af Skjæl, hvad der heller ikke var at vente, da Legemet endnu var halvt gjennemsigtigt, og næsten uden Pigment. Det 2det Exemplar, hvis Totallængde er 198^{mm}, stemmer i alle Dele overens med Typ-Exemplaret, og var, som dette, fuldt skjælbeklædt.

Det allerstørste Individ derimod, hvis Totallængde er næsten dobbelt saa stor, som Typ-Exemplarets, nemlig 217^{mm}, var, mærkeligt nok, endnu næsten ganske uden Skjæl. Blot enkelte Skjæl, der øjensynlig netop befinde sig i Frembrud, kunne opdages henad Halen, men paa hele den forreste Del af Legemet er der ikke Spor af saadanne. I alle andre Henseender ere disse 2 største Individer, der begge erholdtes paa samme Localitet og ved samme Lejlighed, fuldstændig overensstemmende.

Det maa saaledes antages, at Skjælbeklædningen baade anlægges paa et forholdsvis sildigt Stadium, og ganske uregelmæssigt, hos enkelte Individer langt sildigere, end hos andre. Saafremt man vil antage, at Hannerne hos denne Art, i Lighed med, hvad der er paavist hos andre Lycoder, kunne opnaa en betydeligere Størrelse, end Hunnerne, var det at vente, at Skjælbeklædningen anlagdes tidligere hos de sidste, end hos Hannerne. Men det største, og næsten ganske nøgne Individ er netop en Hun, medens det noget mindre, der er tæt skjælbeklædt, er en Han.

The number of the dorsal rays ranged accordingly from 101 to 118. If we deduct the 6 rays in the upper half of the caudal, the whole series will contain 95—112, a number greater than is met with in any of the other species, save in maturer examples of *L. vahlii* and *L. esmarkii*. One of the specimens (*b*) has the origin of the dorsal considerably nearer the nape than have the others. The greatest height of the dorsal about equals one-third of the height of the body; but the true length of the rays, owing to their obliquity, is somewhat greater, or about equal to half the height of the body.

The anal rays range in number from 97 to 103. If we deduct the rays in the lower half of the caudal, probably 5, this series will contain 92—98, a greater number than has yet been met with in any other species.

The pectorals are comparatively long and slender, somewhat elongated, and with but few rays, the number having been found to vary between 13 and 17.

The ventrals are also rather long (shorter however than the longitudinal diameter of the eye), being contained from 6 to $6^1/_2$ times in the length of the head. The number of rays cannot be accurately stated.

Scales. — In one respect, the scaled integument in the specimens of this species exhibited a most remarkable variation, viz. as to the exact point of time at which it begins to develop during the growth of the individual. The typical specimen of this species, described in the first of the preliminary reports treating of the fishes collected on the Expedition, total length 141^{mm}, had the whole body covered with scales; the head, the nape, and the fins were naked. Of the 3 individuals newly obtained (1878), one, a fry-specimen, exhibited no trace of scales, as was indeed to be expected, the body being still semi-translucent and almost colourless. The second example, total length 198^{mm}, agrees perfectly with the typical specimen, being, like that, entirely scaled.

The largest individual, on the contrary, with a total length twice as great as that of the typical specimen (217^{mm}), was, strange to say, well nigh scaleless. A few scales only, and obviously in the first stage of development, could be detected along the tail; on the whole of the anterior part of the body there was no trace of any. In all other respects, these two largest individuals, both of them taken in the same locality and at one time, agree perfectly.

There is, accordingly, every reason to infer, that the scaled integument makes its appearance at a comparatively late stage of growth, and quite irregularly, much earlier in some individuals than in others. Now assuming that the males of this species, in common with what has been shown to hold good with other Lycods, can attain a greater size than the females, the scaled integument would naturally develop earlier in the latter than in the males. But the largest and well nigh naked example, is a female, whereas the smaller specimen, which is densely scaled, is a male.

Det vil heraf være indlysende, hvor vanskeligt det er efter et enkelt eller nogle faa Individer at fremsætte sikre Artscharacterer inden denne Slægt, hvorfor Arternes Begrændsning endnu idethele er i flere Punkter usikker.

Skjællene ere, som hos alle skjælbærende Lycoder, runde, adskilte, og nedtrykte i Huden, hvidagtige af Farve, samt overalt af temmelig lige Størrelse, blot ubetydeligt mindre paa Halen. Langs Ryglinien staa de ubetydeligt tættere, end paa andre Steder af Legemet; dog berøre Skjællenes Rande intetsteds hinanden.

Sidelinien. En Sidelinie, der er ventral, er tilstede, om den end blot med Vanskelighed lader sig forfølge i sin Helhed. Fra Gjællespaltens øvre Ende nedløber i skraa Retning indtil et kort Stykke bagenfor Anus en Række temmelig tætstaaende, særdeles smaa Porer, forbundne indbyrdes ved en fin Linie; efterat have naaet ned næsten til Grunden af Analfinnen, løber Rækken langs med denne et Stykke ud mod Caudalen, uden at det med Nøjagtighed kan angives, hvor den ophører. Maaske vil den hos fuldt udvoxede Exemplarer lade sig forfølge lige til Halespidsen. Den er tydeligst hos det største Individ, hvis Skjælbeklædning endnu blot er i sit Frembrud.

Samtidig kan under gunstig Belysning spores hos et Par af Individerne en Række yderst smaa og fjørntstillede Porer langs Legemets Midtlinie, men uden at denne Række har Characteren af nogen Sidelinie.

Farve. Farven er ensfarvet lyst graabrun; Skjællene overalt lysere, end Legemets Bundfarve. Nedenfor Midtlinien er Legemet hos et af Individerne ubetydeligt lysere, end ovenfor denne. Bughinden er gjennemskinnende sort, selv hos de største Exemplarer, hvilket i Forbindelse med Skjælbeklædningens Udvikling antyder, at intet af dem har naaet sin fulde Udvikling.

Størrelse. Flere Omstændigheder tyde saaledes hen paa, at intet af Individerne endog tilnærmelsesvis have naaet sin fulde Størrelse. Vi have i det foregaaende paavist, at Yngelen af *L. frigidus* er fuldkommen normalt udviklet og har fuld Pigmentering, som de Udvoxede, med en Totallængde af 37 og 62^{mm}, og Arten kan dog opnaa en Størrelse af over 500^{mm}; hos *L. esmarkii*, der kan opnaa en Størrelse af over 600^{mm}, var det samme Tilfældet hos én Unge med en Totallængde af 81^{mm}.

Da det mindste Exemplar af *L. muraena;* hvis Totallængde er 112^{mm}, endnu var transparent, og har fuldkommen Characteren af en spæd Yngel, ligesom fremdeles Skjælbeklædningen hos et Individ med en Totallængde af 217^{mm} endnu blot befandt sig i sit første Frembrud, er det sandsynligt, at man i Fremtiden vil lære at kjende Arten som en mærkelig, aalelignende Form af ganske betydelig Størrelse, naar Apparaterne til Dybvandsfiskes Erhvervelse blive saa fuldkomne, at de ere istand til at ophente saadanne Former, (som det paa Grund af deres Legemsbygning maa antages ere særdeles hurtige), i sin fuldt udviklede Tilstand.

Hence we see how difficult it is, from a single specimen, or several individuals even, to work out specific characters for this genus; and the limits of its species are therefore in many respects as yet uncertain.

As in all of the scaled Lycods, the scales are round, non-contiguous, and imbedded in the skin, whitish in colour, and everywhere nearly equal in magnitude, those on the tail only being a trifle smaller. Down the dorsal line they lie a little closer than on the other parts of the body, the margins however coming nowhere in contact.

Lateral Line. — A lateral line (ventral) is present, though difficult to trace throughout its entire length. From the upper extremity of the gill-opening, a series of small, and rather closely set, pores, passes obliquely downwards to within a short distance behind the vent; after descending nearly to the base of the anal, the series accompanies that fin a short distance in the direction of the caudal, the exact point at which it terminates not admitting however of being determined. In full-grown examples, it will, perhaps, be traceable to the tip of the tail. It is most distinct in the largest individual, on which the scales are just beginning to appear.

Exclusive of the above, a series of minute pores may be discerned, in a good light, in one or two of the specimens, extending along the mesial line of the body; but this series has not the character of a lateral line.

Colour. — A uniform light greyish-brown; the scales everywhere lighter than the ground-colour of the body. Below the mesial line, the body, in one of the specimens, is somewhat lighter than above it. The ventral membrane a lustrous black, even in the largest individuals, from which, along with the peculiarities of development in the scales, we may infer that they have none of them attained maturity.

Size. — Several circumstances, therefore, give reason to infer that none of the individuals were full-grown. We have already shown, that the fry-specimens of *L. frigidus*, total length from 37^{mm} to 63^{mm}, have all the characters of the adult fish, including the coloration, and yet the species can attain a length of 500^{mm}, and above; this was the case, too, with a specimen of *L. esmarkii*, with a total length of 81^{mm}, the extreme length in this species being upwards of 600^{mm}.

The smallest example of *L. muræna*, total length 112^{mm}, being still semi-translucent, and its general appearance precisely that of a fry-specimen; and moreover, the scales in one individual, with a total length of 217^{mm}, having only just commenced developing, — it is not improbable, that at some future period the species will be met with as an anguilliform *Lycodes* of very considerable dimensions, when the apparatus for the capture of deep-sea fishes shall have been so far improved, as to admit of bringing up such forms (which from the structure of their body must be assumed to be rapid swimmers) in the final stage of development.

Føde. Det største af de erholdte Individer var en Hun, og havde umoden Rogn i det eneste Ovarium. Det noget mindre, fuldt skjælbeklædte Individ var en Han.

Ventrikelen af det største Individ indeholdt udelukkende Dele af *Themisto libellula*, Mandt; det noget mindre ligeledes Levninger af *Themisto*, samt et Individ af den af G. O. Sars nylig beskrevne diminutive Isopode *Nannoniscus bicuspis*, hvoraf tidligere blot et Par Individer vare fundne.

Udbredelse. *L. muraena* foreligger for Tiden i 4 Individer, alle optagne fra betydeligt Dyb og iskoldt Vand langt fra Land. Det første erholdtes under Nordhavs-Expeditionens 2det Togt, i 1877, paa Bankerne udenfor Helgeland[1] i Norge, saaledes søndenfor Polarcirkelen; de øvrige fra Expeditionens sidste Togt, i 1878, fra Dybderne udenfor Beeren Eiland og Spitsbergen op til 80° N. B., eller i det Hele saa langt mod Nord, som hensigtsmæssige Dybvandsskrabninger hidtil ere foretagne.

Food etc. — The largest of the specimens was a female, with immature ova in the single ovary. The somewhat smaller, fully scaled individual, was a male.

The ventricle of the female contained exclusively parts of *Themisto libellula*, Mandt; that of the male contained likewise fragments of *Themisto*, and also an example of the diminutive Isopod *Nannoniscus bicuspis*, lately described by G. O. Sars, and of which one or two individuals only had previously been known.

Distribution. — Of *L. muræna* 4 specimens have been obtained up to the present time, all of which were brought up from a considerable depth in the cold area, far from land. The first was taken on the second voyage of the Expedition, in 1877, on the banks off Helgeland[1] in Norway, accordingly south of the Arctic circle; the remaining three were brought up, on the last cruize, in 1878, from the depths off Beeren Eiland and Spitzbergen, — as far north as deep-sea dredging has been undertaken (80°).

Gen. Gymnelis, Reinh.

Overs. 1832—33, Kgl. D. Vid. Selsk. Nat. Math. Afh. 6 Del, p. XXI og XXII. 1837. „*Gymnelus*“ (1832—33).
Kgl. D. Vid. Selsk. Naturv. Math. Afh. 7 Del, p. 116 og 131, 1838. „*Gymnelis*“ (1838).

Legemet langstrakt, aalformigt, nøgent. Sidelinie tilstede, tildels utydelig. Hovedet rundagtigt, med lige lange Kjæver. Finnestraalerne bløde, articulerede og kløvede: Caudalen utydelig, og er uden Overgang forenet med Dorsalen og Analen. Ventralerne mangle. Gjællespalten temmelig trang og højtliggende; Gjællehinderne ikke indbyrdes sammenvoxede paa Hovedets Underside. Tænder i Kjæverne, paa Vomer, og paa Palatinbenene. Gjællestraalerne 6; Pseudobranchier tilstede. Svømmeblære mangler; Appendices pyloricae rudimentære.

Gen. Gymnelis, Reinh.

Overs. 1832—33, Kgl. D. Vid. Selsk. Nat. Math. Afh. 6 Del, p. XXI og XXII. 1837. "*Gymnelus*" (1832—33).
Kgl. D. Vid. Selsk. Naturv. Math. Afh. 7 Del, p. 116 and 131. 1838. "*Gymnelis*" (1838).

Body elongate, anguilliform, naked: lateral line present, but rather indistinct. Head roundish, with jaws equal in length. Fin-rays soft, articulate, and branched: caudal indistinct, continuous with the dorsal and anal. Ventrals wanting. Gill-openings rather narrow, and elevated; the branchial membranes non-continuous on the inferior surface of the head. Teeth in the jaws, on the vomer, and on the palatine bones. Branchiostegals 6; pseudobranchiæ present. Air-bladder wanting: pyloric appendages rudimentary.

24. Gymnelis viridis, (Fabr.) 1780.

Pl. IV, Fig. 32.

Ophidium viride, Fabr. Fauna Groenl., p. 141 (1780).
Ophidium unernak, Lacép. Hist. Nat. Poiss. tom. 2, p. 280 (1800)[2].
Gymnelus viridis, Reinh. Overs. 1832—33, Kgl. D. Vid. Selsk. Nat. Math. Afh. 6 Del, p. XXI, Kbhvn. 1837 (1832—33).

24. Gymnelis viridis, (Fabr.) 1780.

Pl. IV, fig. 32.

Ophidium viride, Fabr. Fauna Groenl., p. 141 (1780).
Ophidium unernak, Lacép. Hist. Nat. Poiss. tom. 2, p. 280 (1800).[2]
Gymnelus viridis, Reinh. Overs. 1832—33, Kgl. D. Vid. Selsk. Nat. Math. Afh. 6 Del, p. XXI. Kbhvn. 1837 (1832—33).

[1] Allerede under det første Aars Expedition, i 1876, erholdtes omtrent paa samme Sted et Exemplar af en *Lycodes*, der ved et Uheld blev bortkastet. Prof. Sars erklærer, at det utvivlsomt har tilhørt samme Art, som ovenfor er benævnt *L. muraena*.
[2] L'an VIII de la République.

[1] On the first voyage of the Expedition, (1876), in the same locality about, an example of a *Lycodes* had been obtained, which was afterwards unintentionally thrown away. Professor Sars states it to have been unquestionably of the same species as that here termed *L. muræna*.
[2] L'an VIII de la République.

Gymnelis viridis, Reinh. Kgl. D. Vid. Selsk. Nat. Math. Afh. 7 Del, p. 116 og 131 (1838).
Cepolophis viridis, Kaup, Wieg. Arch. f. Naturg. 1856, 1. B., p. 96 (1856).
Gymnelis pictus, Günth. Cat. Fish. Brit. Mus. vol. 4, p. 324 (1862).

Diagn. *Farven varierende; ensfarvet, eller med rundagtige mørke Tverfelter; langs Grunden af Dorsalen staa i Regelen 1 eller flere sorte Øjenpletter. Dorsalen begynder over Pectoralens bagre Trediedel. Hovedet indeholdes 6—7 Gange i Totallængden. Størrelsen indtil 300mm.*
M. B. 6. D. 90—100; A. 70—72; C. 8—11; P. 11—13.

Localit. fra Nordh.-Exped. Jan Mayen; Spitsbergen.

	Stat. 237.	—
Beliggenhed.	Jan Mayen.	Norskøerne, N.V.-Spitsbergen.
Dybde.	263 Favne (481 m).	Af Ventrikelen af *Gadus morrhua.*
Temp. paa Bunden.	— 0,3° C.	
Bunden.	GrovtGrusogSmaastene.	
Datum.	3die Aug. 1877.	15de Aug. 1878.
Antal Indiv.	1 Indiv.	3 Indiv.

Bemærkninger til Beskrivelsen. En detailleret Beskrivelse af denne Art er meddelt af Kröyer i 1862 (Naturh. Tidsskr. 3 Række, 1 B. p. 258), hvorfor jeg her blot giver et Par Bemærkninger, vedrørende de foreliggende Specimina.

Totallængden af det første Exemplar er 76mm; heraf udgjorde Hovedets Længde 12mm, og indeholdtes saaledes lidt over 6 Gange i Totallængden; hos de øvrige erholdte Exemplarer har Forholdet ligget mellem 5,7 (det største Individ) og 7,3 (det mindste).

Bundfarven var hos Exemplaret fra Jan Mayen (1877) graagul med talrige (17) noget lysere Tverbaand, der vare smalere, end det mellemliggende Felt af Bundfarven. I Dorsalen stod, som vil sees af Figuren paa Pl. IV, Fig. 32, 3 Pletter, 2 tæt sammen noget bagenfor Finnens Udspring, og en enkelt omtrent paa dens Midte. Endskjønt Kröyer (Naturh. Tidsskr. 3 R. 1 B.) opstiller 33 forskjellige Farvevarieteter, gaar det forhaandenværende Exemplar ikke ind under noget af disse, hvilket viser denne Arts næsten ubegrændsede Varieren.

De 3 Exemplarer fra det sidste Aars Togt (1878), bleve alle udtagne af Ventrikelen af *Gadus morrhua* ved Norskøerne paa Spitsbergens Nordside. Alle ere noget angrebne af Fordøjelsen, saaledes, at Farvetegningen blot paa det ene er for en Del bibeholdt; Finnerne ere hos alle fortærede. Torskene fangedes paa et Dyb af mellem 5 og 10 Favne.

Totallængden af det mindste af disse Exemplarer er 78mm, Hovedlængden 10,6mm. Hos dette og det næste Exemplar, der begge ere yngre, ere Kjæverne relativt langt kortere, end hos de udvoxede Exemplarer, og naa blot hen under Midten af Øjet; Hovedet er ligeledes relativt større i Forhold til Legemet, og indeholdes blot $2^1/_2$ Gange i Afstanden fra Snudespidsen til Anus.

Gymnelis viridis, Reinh. Kgl. D. Vid. Selsk. Nat. Math. Afh. 7 Del, p. 116 og 131 (1838).
Cepolophis viridis, Kaup, Wieg. Arch. f. Naturg. 1856, 1 B. p. 96 (1856).
Gymnelis pictus, Günth. Cat. Fish. Brit. Mus. vol. 4. p. 324 (1862).

Diagnosis. — *Colour varying; uniform or with dark, roundish, transverse patches; along the base of the dorsal, as a rule one or more black occelli. Dorsal commencing above the posterior third of the pectorals. Head contained from 6 to 7 times in the total length. Length reaching 300mm.*
M. B. 6; D. 90—100; A. 70—72; C. 8—11; P. 11—13.

Locality (North Atl. Exped.): — Jan Mayen; Spitzbergen.

	Stat. 237.	—
Exact Locality.	Jan Mayen.	Norsk Islands, NW. Spitzbergen.
Depth.	263 Fathoms (481 m).	From the Ventricles of *Gadus morrhua.*
Temp. at Bottom.	— 0.3° C.	
Bottom.	Coarse Sand and Shingle.	
Date.	3rd Aug., 1877.	15th Aug. 1878.
Numb. of Specim.	1 Indiv.	3 Indiv.

Descriptive Observations. — A detailed description of this species having been furnished by Kröyer in 1862 (Naturh. Tidsskrift. 3 Række, 1 B. p. 258), I shall confine myself to a few remarks on the specimens obtained on the Expedition.

Total length of the first individual 76mm; length of the head 12mm, being accordingly to the former as 1 to 6; in the remaining examples, the proportion varies between 5.7 (the largest individual) and 7.3 (the smallest).

The ground-colour in the specimen from Jan Mayen (1877) was greyish-yellow, with numerous (17) transverse bands of a somewhat lighter shade, and narrower than the space between. The dorsal had, as will be seen in the figure (Pl. IV, fig. 32), 3 spots: 2 close together, a little posterior to the origin of the fin, and 1 about in the middle. Kröyer (Naturh. Tidsskr. 3 R. 1 B.) has established 33 differently coloured varieties; but this specimen does not agree with any one of them: which shows the almost unlimited extent to which the species is found to vary.

The 3 specimens obtained on the last voyage of the Expedition (1878) were all taken from the ventricles of *Gadus morrhua*, captured off the Norsk Islands, on the north coast of Spitzbergen. All three are in a partially digested state; in one only can a few vestiges of the coloration be discerned, the fins are entirely gone in all. The cods were taken at a depth of from 5 to 10 fathoms.

Total length of the smallest of these examples 78mm; length of the head 10.6mm. In this, and in the specimen next in size, both of them immature, the jaws are relatively much shorter than in the full-grown individuals, not reaching farther back than under the middle of the eye; the head, too, is relatively larger in proportion to the body, being contained only $2^1/_2$ times in the distance from the point of the snout to the vent.

Totallængden af det andet Individ er 80mm, Hovedlængden 12mm. Farven er nogenlunde vel bibeholdt paa Legemets Sider, og viser omtrent 11 brede brunsorte ringformige Tverpletter, der i Midten ere lysere; dette Exemplar svarer ideth ele til den Form, som af Günther (Cat. Fishes Brit. Mus. vol. IV, p. 325) opføres som en distinct Art under Navn af *G. pictus*, men som neppe kan ansees som skilt fra den typiske *G. viridis*, hvilket allerede Malmgren tidligere har paavist (Öfv. Kgl. Vet. Ak. Förh. 1864, p. 514)[1]. Af de Kröyer-Reinhardt'ske Varieteter gaar det nærmest ind under *var. y*, uden dog ganske at svare til denne. (Cfr. Naturh. Tidsskr. 3 R. 1 B., p. 260, Kbhvn. 1861—63).

Totallængden af det største Individ er 143mm, Hovedlængden 25mm; Kjæverne naa tilbage til Bagranden af Øjet. Hovedet indeholdes $2^1/_3$ Gange i Afstanden fra Snudespidsen til Anus.

Ligesom hos Slægten *Lycodes* ere Dorsal- og Analstraalerne leddede, samt ved Grunden delte med et tydeligt Mellemrum, hvorimod hver Halvdel senere er sammenhængende. Straaleantallet var hos det største Individ: *D. 92; C. ?; A. 70.*

I Munden af det sidste Individ fandtes et Exemplar af *Modiolaria laevigata*, Gray.

Udbredelse: Er maaske circumpolær, og er truffet saavel i Berings-Strædet, som ved Kysterne af det arctiske America og Europa. I størst Antal er den indsamlet ved Grønlands Kyster, hvor den synes at maatte henregnes til de almindeligste Fiskearter. I Øst-Grønland blev den af den engelsk-arctiske Expedition indsamlet i 1875—76 mod Nord lige op til 81° 52′ N. B. Allerede de svenske Polar-Expeditioner have fundet den, men først under det sidste Togt (1872) i nogen Mængde, ved Spitsbergen, og den gaar her op til de nordligste Punkter, der have været undersøgte; derimod er den endnu ikke paavist paa Americas Østkyst søndenfor Grønland, eller ved det europæiske Continent.

[1] Næsten alle unge Individer, optagne ved Spitsbergen under de sidste Expeditioner (1864—72), og som opbevares i Riks-Museum i Stockholm, hvor jeg i 1879 ved Prof. Smitts Velvillie havde Lejlighed at undersøge dem, tilhøre Formen *pictus*, idet Legemet er tegnet med sadelformige Tverbaand; enkelte Individer ere i Midten af Legemet næsten ganske sorte, og havde blot oventil Spor af lysere Tverbaand.

Total length of the second specimen 80mm; length of the head 12mm. The coloration is comparatively well retained on the sides, exhibiting about 11 broad, brownish-black, annular transverse spots, lighter in the middle; this specimen agrees in all essential features with the form referred by Günther (Cat. Fishes Brit. Mus. vol. IV, p. 325) to a separate species, under the name of *G. pictus*, but which, as already shown by Malmgren (Öfv. Kgl. Vet. Ak. Förh. 1864, p. 514),[1] can hardly be distinct from the typical *G. viridis*. Of the varieties established by Kröyer and Reinhardt, it comes nearest to that indicated by *var. y*; but even with this form it does not strictly agree (*vide* Naturh. Tidsskr. 3 R. 1 B., p. 260, Kbhvn. 1861—63).

Total length of the largest individual 143mm; length of the head 25mm; jaws reaching back to the posterior margin of the eye; head contained twice and one-third in the distance from the point of the snout to the vent.

As in the genus *Lycodes*, the dorsal and anal rays articulated, and distinctly cleft to the base, the halves, however, being from thence connate. Number of fin-rays in the largest specimen: — *D. 92; C. ?; A. 70.*

The last-mentioned individual had in its mouth an example of *Modiolaria lævigata*, Gray.

Distribution. — Possibly circumpolar; it has been met with both in Behring's Straits and on the shores of Arctic America and Europe. The greatest number of specimens have been collected on the coasts of Greenland, where it would seem to be one of the commonest fishes. Off the coast of East Greenland, it was taken on the English Arctic Expedition in 1875—76, as far north as 81° 52′. The species had previously been met with on the Swedish Polar Expeditions; but not in any great abundance till 1872, off the coast of Spitzbergen, its range here extending to the most northerly localities; it has not as yet been observed on the eastern coast of America, south of Greenland, or on the shores of the European continent.

[1] Nearly all the young individuals taken off the coast of Spitzbergen on the latest of the Swedish Expeditions (1864—72), and which are preserved in the Riks-Museum at Stockholm, where, in 1879, Professor Smitt kindly permitted me to examine them, belong to the form *pictus*, the body being marked with saddle-shaped transverse bands; some of the individuals, however, are almost black on the middle of the body, the upper part only exhibiting traces of transverse bands.

Subord. Anacanthini.

Fam. Gadidae.

Gen. Gadus, Lin.

Syst. Nat. ed. 12, tom. 1, p. 435 (1766).

25. **Gadus saida,** Lepech. 1774.

Pl. IV, Fig. 33.

Gadus saida, Lepech. Nov. Comm. Acad. Sci. Imp. Petrop. tom. 18, 1774, p. 512, Tab. 5, Fig. 1 (1774).
Gadus æglefinus, Fabr. (nec. Lin.) Fauna Groenl. No. 100, p. 142 (1780).
Merlangus polaris, Sab. Suppl. App. Parry's First Voy., p. 211 (1824).
Gadus fabricii, Richards. Fauna Bor.-Am. vol. 3, p. 245 (1836).
Gadus polaris, Richards. Fauna Bor.-Am. vol. 3, p. 247 (1836).
Gadus agilis, Reinh. Kgl. D. Vid. Selsk. Natur. Math. Afh. 7 Del, p. 126 (1838).
Pollachius polaris, Gill, Proc. Acad. Nat. Sci. Philad. 1861, App. p. 48 (1861).
Gadus (Boreogadus) saida, Günth. Cat. Fish. Brit. Mus. vol. 4, p. 337 (1862).
Gadus (Boreogadus) fabricii, Günth. Cat. Fish. Brit. Mus. vol. 4, p. 336 (1862).
Boreogadus polaris, Gill, Proc. Acad. Nat. Sci. Philad. 1863, p. 233 (1863).
Gadus glacialis, Peters, 2te D. Nordpol.-Exp. B. II, p. 172 (Leipz. 1874).

Diagn. *Underkjæven længere, end Overkjæven. En rudimentær Skjægtraad tilstede. Hovedet indeholdes 4 Gange i Totallængden; Øjnene store, indeholdes 3—4 Gange i Hovedlængden. Legemet langstrakt og slankt, Haleroden særdeles smal, Caudalen dybt kløftet; Finnerne adskilte ved et tydeligt Mellemrum. Anus ligger under 1ste Straale af 2den Dorsal. Tænderne særdeles fine; i Overkjæven ere de i den ydre Række ubetydeligt større, end de øvrige Tænder. Skjællene cirkelrunde, smaa, adskilte. Sidelinien farveløs, ofte bagtil utydelig, noget sænket under 2den Dorsal; iøvrigt ret. Et fremtrædende System af Slimporer paa Hovedet. Farven oventil rødlig graabrun, nedtil sølvhvid; Finnerne mere eller mindre sortagtige. Størrelsen indtil 220*mm *(og derover).*

1 D. 12 (13—14); 2 D. 12—15 (16); 3 D. 19—20 (17—18, eller 21—23); 1 A. 17 (16 eller 18); 2 A. 19—22 (23); P. 17—18; V. 6.

Subord. Anacanthini.

Fam. Gadidæ.

Gen. Gadus, Lin.

Syst. Nat. ed. 12, tom. 1, p. 435 (1766).

25. **Gadus saida,** Lepech. 1774.

Pl. IV, fig. 33.

Gadus saida, Lepech. Nov. Comm. Acad. Sci. Imp. Petrop. tom. 18, 1774, p. 512, Tab. 5, Fig. 1 (1774).
Gadus æglefinus, Fab. (nec Lin.) Fauna Grœnl. No. 100, p. 142 (1780).
Merlangus polaris, Sab. Suppl. App. Parry's First Voy. p. 211 (1824).
Gadus fabricii, Richards. Fauna Bor.-Am. vol. 3, p. 245 (1836).
Gadus polaris, Richards. Fauna Bor.-Am. vol. 3, p. 247 (1836).
Gadus agilis, Reinh. Kgl. D. Vid. Selsk. Natur. Math. Afh., 7 Del, p. 126 (1838).
Pollachius polaris, Gill, Proc. Acad. Nat. Sci. Philad. 1861, App. p. 48 (1861).
Gadus (Boreogadus) saida, Günth. Cat. Fish. Brit. Mus. vol. 4, p. 337 (1862).
Gadus (Boreogadus) fabricii, Günth. Cat. Fish. Brit. Mus. vol. 4, p. 336 (1862).
Boreogadus polaris, Gill, Proc. Acad. Nat. Sci. Philad. 1863, p. 233 (1863).
Gadus glacialis, Peters, 2te D. Nordpol.-Exp. B. II, p. 172 (Leipz. 1874).

Diagnosis. — *The lower jaw longer than the upper, and bearing a rudimentary barbel. Length of head to total length as 1 to 4; eyes large, the diameter being from* $^1/_3$ *to* $^1/_4$ *of the length of the head. Body slender and elongated; peduncle of tail narrow. Caudal deeply forked; the fins separated, a distinct space intervening. The vent placed under the 1st ray of the 2nd dorsal. Teeth extremely minute; in the upper jaw, those in the outer series are a trifle larger than the other teeth. The scales circular, small, and non-contiguous. Lateral line colourless, the posterior part often indistinct, slightly inclining under the second dorsal. On the head, a well-defined system of mucous pores. Colour above reddish-brown and grey, under surface of a silvery white; fins blackish. Length reaching 220*mm *(and above).*

1 D. 12 (13—14); 2 D. 12—15 (16); 3 D. 19—20 (17—18 or 21—23); 1 A. 17 (16 or 18); 2 A. 19—22 (23); P. 17—18; V. 6.

Localit. fra Nordh.-Exped. Havet mellem Beeren Eiland og Spitsbergen, samt Magdalene-Bay paa Spitsbergen.

	Stat: 226.	—	*Stat. 366.*
Beliggenhed.	105 Kil. N. Beeren-Eiland.	Norsk-Øerne, Spitsbergen.	Magdalenebay, N. Spitsbergen.
Dybde.	?	Ubetydelig.	Ubetydelig.
Temp. paa Bunden.	+ 1,6° C.	?	−0,2 til − 2,1° C.
Datum.	3die Aug. 1878.	15de Aug. 1878.	17de Aug. 1878.
Antal Indiv.	1 yngre Indiv.	1 Unge.	72 unge Indiv.

Bemærkninger til Synonymien. Det kan neppe længere være Tvivl underkastet, at alle de Former, som ere beskrevne under Navnene *G. polaris*, (Sab.) 1824, *G. fabricii*, Richards. 1836, eller *G. agilis*, Reinh. 1838, fra Spitsbergen, Island, Grønland og andre Punkter af det arctiske America, i Virkeligheden gaa ind under den af Lepechin i 1774 fra det hvide Hav beskrevne *Gadus saida*, hvilket allerede Malmgren i sin Fortegnelse over Spitsbergens Fiskefauna af 1864 har antaget for sandsynligt[1], og Prof. Smitt har udtalt samme Anskuelse i en Meddelelse til Vetenskaps-Akademien i Stockholm i 1876. Vistnok er Lepechin's originale Beskrivelse ingenlunde udtømmende, eller endog synderlig nøjagtig[2]. Men en umiddelbar Sammenligning, som jeg har kunnet anstille mellem Exemplarer af *G. saida* fra Archangel, afgivne til Universitets-Musæet af Lieutn. Sandeberg, og de Individer, som Musæet i de seneste Aar modtaget fra Grønland, Spitsbergen og Novaja Zemlja, har bestyrket den Antagelse, at de alle ere identiske.

At Individerne fra Hvidehavet i Regelen have havt mørkere Finner, kan vistnok alene tilskrives, at de tilfældigvis havde en betydeligere Størrelse, idet de Individer fra de øvrige Localiteter, hvortil jeg har havt Adgang, saagodtsom alle have været mindre, end halvvoxne. Men iøvrigt stemme de alle i sin Skjælbeklædning, Tandbygning, Stillingen af Anus og i ethvert Punkt af Legemsbygningen saa fuldkommen overens, at nogen Adskillelse mellem dem som distincte Arter ikke er mulig. I Overensstemmelse hermed opføres Arten under det ældste Lepechin'ske Navn, *Gadus saida*[3].

En betydelig Lighed udviser Arten med den af Peters i „2te Deutsche Nordpolar-Exp.", B. II, p. 172 (Leipz. 1874)

[1] Öfv. Kgl. Vet. Ak. Förh. 1864, p. 531. Arten opføres dog paa dette Sted under Navnet *Boreogadus polaris*, (Sab.).

[2] Det er saaledes sandsynligvis efter denne Tegning, at Günther i Diagnosen for *G. saida* beskriver Stillingen af Anus i Cat. Fish. Brit. Mus. vol. 4, p. 337.

[3] Navnet *saida* er dannet af det Trivialnavn, hvorunder Arten er kjendt paa den russiske Kyst, og da dette utvivlsomt er det samme, som Nordmændenes „Sei" (*G. virens*), antydes herved en Overensstemmelse i det Ydre, mellem disse 2 Arter. Denne Lighed er dog ikke større, end at Arterne allerede ved et hurtigt Blik kunne adskilles, saaledes ved Skjælbeklædningen, Legemsbygningen, Stillingen af Anus; etc.

Locality (North Atl. Exped.): — The open sea, between Beeren Eiland and Spitzbergen; Magdalene Bay, on the coast of Spitzbergen.

	Stat. 226.	—	*Stat. 366.*
Exact Locality.	105 Kil. N. Beeren Eiland.	Norsk Islands, Spitzbergen.	Magdalene Bay, N. Spitzbergen.
Depth.	?	Trifling.	Trifling.
Temp. at Bottom.	+ 1.6° C.	?	−0.2 to − 2.1° C.
Date.	3rd Aug. 1877.	15th Aug. 1878.	17th Aug. 1878.
Numb. of Specim.	1 Indiv. (young).	1 Indiv. (young).	72 Indiv. (young).

Remarks on the Synonymy. — There can be very little reason to doubt, that the divers forms occurring on the coast of Spitzbergen, Iceland, Greenland, and Arctic America, described as *G. polaris*, (Sab.) 1824; *G. fabricii*, Richards., 1836; or *G. agilis*, Reinh. 1838, are identical with *Gadus saida*, the species diagnosticated by Lepechin in 1774, from an example taken in the White Sea: an assumption supported by Malmgren[1] in his List of Spitzbergen Fishes, published 1864; Professor Smitt, too, arrived at the same conclusion in 1876, as appears from his communication to the Swedish Vetenskaps Akademi. The diagnosis originally furnished by Lepechin is doubtless far from complete, and leaves, too, not a little to be desired in point of accuracy[2]; but direct, autoptical comparison between examples of *G. saida* from Archangel, procured for the University Museum by Lieut. Sandeberg, and individuals sent to the Museum from Greenland, Spitzbergen, and Novaja Zemlja, has still further convinced me of the plausibility of this hypothesis.

The darker colour of the fins characterising the majority of the White Sea specimens, must be unquestionably ascribed to their having been of a larger size, since the individuals from other localities that I have had opportunity of examining, were all of them in more or less early stages of growth. For the rest, however, they agree so closely, viz. in the arrangement of the scales, in the dental characters, the position of the vent, and every feature connected with the structure of the body, as to preclude the possibility of distinction. Hence the species is classed here with Lepechin's original name, *Gadus saida*.[3].

This species bears a close resemblance to *G. glacialis*, diagnosticated by Peters in "Zweite Deutsche Nordpolar-

[1] Öfv. Kgl. Vet. Ak. Förh. 1864, p. 531. The species is referred here, however, to *Boreogadus polaris*, (Sab.).

[2] Probably, it was Lepechin's representation from which Günther determined the position of the vent in his diagnosis of *G. saida*, in Cat. Fish. Brit. Mus. vol. 4, p. 337.

[3] The designation *saida*, is adopted from the trivial name by which the species is known on the Russian coast; and this term being obviously a corruption of the Norwegian "Sei" (*G. virens*), serves to indicate an external similarity in the two species. The resemblance, however, is not greater, but that a glance will suffice to distinguish them: viz. by reason of the deviation in the arrangement of the scales, the position of the vent, the general structure of the body, &c.

beskrevne *G. glacialis*, opstillet efter et enkelt i 1870 ved Sabine-Øen paa Grønlands Østkyst erholdt Individ, og det er sandsynligt, at denne ligeledes gaar ind under *G. saida*.

Dette Individ havde Tænder ogsaa paa Palatinbenene, en Ejendommelighed, der dog sandsynligvis maa opfattes som en blot individuel Variation, som ikke kan tillægges Vægt som Artscharacter, idet den samme Ejendommelighed, ifølge Dr. Lütkens Undersøgelser, nylig er bemærket undtagelsesvis ogsaa hos den ægte *Gadus saida*. Iøvrigt er dette Individ i alle Henseender overensstemmende med den sidstnævnte Art.

Dr. Günther har (1862) henført *G. saida* under Underslægten *Boreogadus*, characteriseret (blandt Arterne med Underkjæven længst) ved, at Tænderne i Overkjævens ydre Række ere større, end i den indre Række (Cat. Fish. vol. 4, p. 336). Imidlertid synes denne Character hos *G. saida* at være af temmelig underordnet Betydning, da baade Overkjævens Tænder, samtlige ere ganske smaa, og Forskjellen mellem dem særdeles ringe.

Beskrivelse. *Legemsbygning.* *G. saida* udmærker sig fremfor de øvrige europæiske Arter ved sit langstrakte og smækre Legeme, den tynde Halerod, der indeholdes omtrent 4 Gange i Underkjævens Længde, den langt tilbagetrukne Anus, de smaa og runde Skjæl, og ved det stærkt udviklede System af Slimporer og Papiller paa Hovedet; fremdeles ved den næsten farveløse og noget bøjede Sidelinie, de forholdsvis store Øjne, og ved den dybt kløftede Caudal.

Det største af de under Expeditionen erholdte Individer har havt en Totallængde af 203^{mm}, hvoraf Hovedlængden udgjorde 49^{mm}. Det mindste Exemplar havde en Totallængde af 65^{mm}, en Hovedlængde af 16,5^{mm}; de fleste Individer i det store Stim, der optoges i et enkelt Kast med Trawlnettet i Magdalenebay, vare Unger; der havde en Længde af 90 til 110^{mm}.

I Totallængden indeholdes Hovedets Længde saaledes næsten nøjagtigt 4 Gange, Legemets Højde omtr. 7 Gange. Underkjæven rager tydeligt frem foran Overkjæven, og Mundvinkelen naar ikke fuldt hen under Øjets Midte.

Øjnene ere forholdsvis store, og udgjøre hos Ungerne (med en Totall. af 70^{mm}) omtrent $^1/_3$, hos de ældre næsten $^1/_4$ af Hovedlængden. Hos de første er Øjets Diameter omtrent af Snudens Længde, hos ældre Individer betydeligt kortere.

En liden Skjægtraad paa Hagen er altid tilstede; hos Ungerne er denne dog lidet fremtrædende, men naar hos de ældre en Længde af omtrent $^1/_4$ Øjendiameter.

Tænderne ere fine, men yderst skarpe, krummede indad, og danne en sammenhængende Række i Mellemkjæverne og i Underkjæven; indenfor denne kan spores en indre Række, bestaaende af yderst fine Tænder, der blot fortil ere nogenlunde tydelige. Disse sidstnævnte Tænder ere ubetydeligt lavere, end den ydre Rækkes. Vomer er ligeledes tandbærende, medens Palatinbenene ere regulært glatte, undtagelsesvis (ifølge Dr. Lütken og Prof. Peters) tandbærende.

Exped.," B. II, p. 172, and described from one individual, taken in 1870, off Sabine Island, on the east coast of Greenland; *G. glacialis*, too, must probably be referred to *G. saida*.

This example had also teeth on the palatine bones, a peculiarity of dentition that should probably be regarded as a mere individual feature, and to which no weight can be attached as a specific character, seeing that the same peculiarity, according to the result of Dr. Lütken's examination, has been lately observed even in the true *Gadus saida*. For the rest, the individual in question agrees in all respects with that species.

Dr. Günther has classed (1862) *G. saida* under the sub-genus *Boreogadus*, characterised (amongst the species that have the lower jaw longer than the upper) by having the teeth in the outer series on the upper jaw larger than those in the inner series (Cat. Fish. vol. 4). But this character in *G. saida* would appear to be of minor importance, seeing that the whole of the teeth in the upper jaw are exceedingly small, and the difference between them very trifling.

General Description. *Structure of the Body.* — This species is distinguished from its other congeners in Northern Europe as follows: — Body slender, elongated; peduncle of tail slender at the base, which is to the length of lower jaw nearly as 1 to 4; position of vent far behind; scales small, circular; head furnished with a well-developed system of mucous pores and papillæ; lateral line almost colourless, and slightly bending; eyes comparatively large; caudal fin deeply forked.

The largest of the individuals taken on the Expedition had a total length of 203^{mm}, the length of the head being 49^{mm}. Total length of the smallest example 65^{mm}; length of head 16.5^{mm}. Most of the individuals in the draught brought up with the trawl-net in Magdalene Bay, had a total length of from 90^{mm} to 110^{mm}.

Length of head equalling almost exactly $^1/_4$ of total length; depth of body about $^1/_7$. Lower jaw projecting perceptibly beyond upper; angle of mouth reaching back very nearly under the middle of the eye.

Eyes comparatively large; longitudinal diameter, in young examples (total length 70^{mm}), about $^1/_3$; in adults, almost $^1/_4$ of the length of the head. In the former, the diameter of the eye nearly corresponds with the length of the snout; in mature individuals, it is considerably less.

A small cirrus on the chin, never wanting; in young examples almost rudimentary; it attains in adults a length about equal to $^1/_4$ of the diameter of the eye.

Teeth minute, but exceedingly sharp, curving inwards; on the intermaxillaries and in the lower jaw constituting a continuous series; within this row extends another, composed of exceedingly minute teeth, distinct in the forepart only; these inner teeth are a trifle shorter than those forming the exterior series. The vomer likewise dentiferous; the palatine bones as a rule smooth; exceptionally, however, according to Dr. Lütken and Prof. Peters, also dentiferous.

Anus er forholdsvis langt tilbagerykket, saaledes, at det er stillet verticalt enten under den første Straale af 2den Dorsal, eller ialfald kun ubetydeligt foran denne.

Finnerne. Finnestraalernes Antal er hos denne Art, som hos de fleste øvrige *Gadidae*, saa store Variationer underkastet, at det ikke er skikket til at afgive bestemte Artscharacterer. Malmgren har i sin „Spetsbergens Fiskfauna“ (1864) talt Straalerne hos 8 Individer, og fundet Antallet at variere mellem følgende Tal:

1 D. 12, undertiden 13 eller 14.
2 D. 12—15.
3 D. 19—20, hos et enkelt Individ 23.
1 A. 17, hos et enkelt Individ 16.
2 A. 19—22.
P. 17—18.

Hermed stemmer idethele overens Angivelserne hos Fabricius („*G. aeglefinus*“, Fauna Groenl.), og Richardson (*Merlangus polaris*); dog har den sidste fundet 16 Straaler i 2den Dorsal, og 23 Straaler i 2den Anal. De Tællinger, som jeg har foretaget hos Individer fra Spitsbergen, Novaja Zemlja og Archangel, have idethele ligget indenfor de ovenfor nævnte Angivelser; dog har jeg fundet Tallet i 3die Dorsal at gaa ned til 17, og i 1ste Anal at gaa op til 18.

Mellemrummet mellem hver Finne er distinct, og idethele større, end hos de nærmest staaende Arter. Hos de ældre Individer er dette Mellemrum omtrent ligt én Øjendiameter, hos de yngre Individer kortere. Pectoralerne ere spinkle og tilspidsede; 2den Ventralstraale ender i et kort Filament. Caudalen er dybt kløftet.

Skjælbeklædning. Skjællene ere yderst smaa, ikke imbricate, men cirkelrunde, og have hos de ældre fuldstændigt fri Rande, idet de ere stillede med et tydeligt Mellemrum indbyrdes; mere tætstaaende ere de hos Ungerne. Skjælbeklædningen er jevnt udbredt over Legemet, og strækker sig fremover lige ud paa Snuden, ligesom ogsaa Gjællelaagene ere skjælbeklædte.

Sidelinie og Slimporer. Sidelinien er farveløs, eller ubetydeligt lysere, end Bundfarven; den strækker sig fra Gjællespaltens øvre Ende hen til Slutningen af 1ste Dorsal, hvor den bøjer skraat nedad til Legemets Midtlinie, som den nu følger ud til Caudalen. Hos yngre Individer er den, især i sin bagre Del, utydelig.

Særdeles characteristisk er det System af Slimporer, der hos friske og uskadte Individer danner et constant og regelmæssigt udbredt Net over Hovedet. Mellem disse større Slimporer findes talrige mindre omstrøede, ligesom der ogsaa findes enkeltvis, eller (paa et Sted) en Række af særdeles korte Hudtrevler eller Papiller, der altid paa uskadte Individer rage kjendeligt længere frem, end Slimporerne, og ikke synes at være perforerede, som disse.

Skjønt disse Rækker ere noget varierende hos de forskjellige Individer, lade sig i Regelen med Lethed gjenfinde følgende som de mest iøjnefaldende:

Paa Hovedets Overside gaar en lang Række Slimporer fra Snudespidsen bagover langs den øvre Rand af Øjet,

Vent comparatively far behind, its position being either vertical under the first ray of the second dorsal fin, or but very slightly anterior to it.

Fins. — The number of fin-rays in this species, as in most of the other *Gadidæ*, varies to so great an extent, that the fin-ray formula is of hardly any value as a specific character. Malmgren gives in his "Spetsbergens Fiskfauna" (1864) the number of fin-rays in 8 individuals; it varied as follows: —

1 D. 12; in some examples 13—14.
2 D. 12—15.
3 D. 19—20; in one specimen 23.
1 A. 17; in one specimen 16.
2 A. 19—22.
P. 17—18.

With these figures the fin-ray formulæ given by Fabricius ("*G. æglefinus*," Fauna Grœnl.) and by Richardson (*Merlangus polaris*), very nearly correspond; Richardson, however, observed 16 rays in the second dorsal, and 23 rays in the second anal. In the specimens from Spitzbergen, Novaja Zemlja, and Archangel examined by myself, the fin-ray formulæ lay in the majority of cases within the limits cited above, the number of rays in 3 D. having, however, been as low as 17, and in 1 A. as high as 18.

The space between the several fins is distinctly defined, and as a rule wider than in its nearest congeners. In mature individuals, the width of this space about equals the diameter of the eye; in young examples it is less. Pectorals slender and elongated; the second ventral ray terminating in a short filament. The caudal fin deeply forked.

Scales. — The scales exceedingly minute, not imbricate, but circular in form, and the margins perfectly free in adults, with a distinct space between; more closely set in young individuals. The scaling uniform, covering the whole surface of the body, and extending forwards over the snout; the gill-plates, too, covered with scales.

Lateral Line and Mucous Pores. — Lateral line colourless, or perhaps a shade lighter than the colour of the ground; it commences at the upper extremity of the branchial opening, extending from thence to the termination of the first dorsal, at which point it strikes off obliquely to the mesial line, passing straight along it to the caudal. Indistinct in young individuals, particularly throughout the posterior division.

The system of mucous pores is highly characteristic, extending in healthy individuals over the surface of the head, like network. Dispersed between these pores, are numerous smaller ones, together with minute cirri, or papillary warts, which occur either isolated or (in one place) arranged as a regular series; and, in all perfect specimens, rising perceptibly higher than the mucous pores; unlike the latter, they show no traces of being perforate.

These series of pores are found to vary in different individuals; but, as a rule, the most conspicuous among them admit of being determined without much difficulty.

On the head, a long series, extending from the point of the snout along the upper edge of the eyes, and ter-

og standser ved dettes bagre Rand; en kortere Række gaar fra Snudespidsen hen under forreste Næsebor til det bagre Næsebor, ligesom en anden Række gaar bueformigt under denne hen mod Øjets forreste Rand.

Paa Kinderne strækker en Række sig fra Snudespidsen langs Overranden af Overkjæven, og bøjer hen under Øjet. Paa Underkjæven strækker en Række sig fra Symphysis bagover, og standser i Regelen ved Underkjævens Led.

Paa Gjællelaagene gaar en Række fra Underkjæveleddet hen langs Gjællelaagets Rand, og en anden kortere næsten parallelt indenfor denne. Mellem begge disse Rækker strækker sig en Række af omtrent 4 yderst korte, hvidagtige Hudtrevler.

Paa Panden staar en i Regelen V-formig (men ofte uregelmæssig) Samling af Slimporer, og paa Siderne og Nakken mindre Grupper, tilligemed enkelte spredte Slimporer og Hudtrevler.

Farve. Farven er hos de yngre Individer i levende Live mat sølvglindsende, oventil mere rødlig, idet Legemet her er bestrøet med talløse rødbrune Punkter, der paa Hovedet staa tættest; opbevarede paa Spiritus blive de lysere uden tydelige Pletter, og blot hos enkelte Individer findes mørkere Skygninger henad Ryggen, ligesom Finnerne hos enkelte have tydelige mørke Rande. Bugen er stærkere sølvfarvet.

Ældre Individer ere mørkere farvede; især ere Finnerne stærkt pigmenterede, og synes, naar de ere sammenslaaede, næsten sorte i sin ydre Del. Analerne ere dog noget lysere.

Føde. De under Nordhavs-Expeditionen erholdte Individer optoges, som det syntes, i de mellemliggende Vandlag, men observeredes ikke umiddelbart i eller ved Vandskorpen, saaledes som tidligere under andre Expeditioner. Ved én Lejlighed ophentede Trawlen i et enkelt Kast 72 Stykker, alle Unger, med en jevn Størrelse af omkr. 100mm, saaledes at de utvivlsomt gaa stimevis, som de øvrige Arter; men de Dyrelevninger, som fandtes i deres Ventrikel, tilhørte hovedsagelig (tildels udelukkende) *Calanus finmarchicus*, Gunn., eller hos et Individ *Themisto libellula*, Mandt, blandet med Calaner, saaledes pelagiske Former, der færdes i enhver Dybde.

Paa Gjællerne af et af Individerne snyltede en Lernæ (af Slægten *Haemobaphes);* et Par andre smaa Snyltekrebs vare fæstede til Huden af samme Individ.

Udbredelse. Under den Forudsætning, at de ovenfor nævnte, under Navnene *Merlangus polaris*, *Gadus fabricii*, *Gadus agilis* og *Gadus glacialis* opstillede Former ere identiske med *Gadus saida* fra Hvidehavet, optræder denne Art talrigt i Europas og Americas Polartrakter, og hører til de Fiske, der ere observerede længst mod Nord. Den færdes helst mellem Drivisen, og tilhører udelukkende den kolde Area.

minating at their posterior margin; a shorter series, extending from the point of the snout under the anterior nostril; and another, bending archwise beneath the latter to the anterior margin of the eye.

On the cheeks, a series extending from the point of the snout along the superior margin of the upper jaw, passing from thence obliquely under the eye. On the lower jaw, a series commencing at the symphysis, and terminating at the articulation of the inferior maxillary bone.

On the gill-plates, a series extending from the articulation of the inferior maxillary along the margin of the opercle; and a shorter, inner series running almost parallel to the former. Between these two series of pores, a row of about 4 whitish cirri, exceedingly short.

On the forehead, too, there is a collection of mucous pores, having, as a rule, the shape of the letter V; and on the sides of the head and on the nape there occur smaller groups, together with a few isolated mucous pores and cutaneous filaments.

Colour. — Live individuals, comparatively young, distinguished by a silvery lustre; upper surface reddish, being freckled with innumerable points of reddish-brown, more especially on the head; specimens preserved in spirits gradually fade, the spots becoming indistinct; darkish cloudings down the back are, however, observed in a few individuals, and the margin of the fins, too, keeps dark in some. The abdomen argenteous.

Mature examples relatively darker, in particular on the fins, which, owing to the pigment secreted under the skin, have almost the appearance of being bordered with black. The anals somewhat lighter.

Food. — The individuals obtained on the Expedition, contrary to the experience of former observers, were taken in the intermedial strata of the ocean, having on no occasion been met with at or near the surface. In Magdalene Bay, 72 individuals, all of them young, the total length averaging about 100mm, were brought up together in the trawl-net, showing beyond doubt that this species, in common with its congeners, moves in shoals; but the animal remains found in the ventricles of the specimens examined, belonged chiefly (in some instances exclusively) to *Calanus finmarchicus*, or consisted of fragments of *Themisto libellula*, along with *Calani*, accordingly pelagic forms, occurring at all depths, from the surface to the bottom.

On the gills of one specimen was found an example of a *Hæmobaphes;* two other small parasitic crustaceans had attached themselves to the skin of the same individual.

Distribution. — Assuming the forms established as *Merlangus polaris*, *Gadus fabricii*, *Gadus agilis*, and *Gadus glacialis* to be identical with *Gadus saida*, inhabiting the White Sea, this species is common in the Polar tracts of Europe and America, and is one of the fishes observed farthest north. It is met with mostly between the drift-ice, its habitat being exclusively confined to the frigid area.

I Europa er den af Parry fundet lige op til 82° 40', ovenfor Spitsbergen; den er idethele talrigt udbredt omkring denne Øgruppe, og er observeret stimevis at svømme om mellem Isstykkerne i Fjordene. Fra Novaja Zemlja ejer Universitets-Musæet Exemplarer, indsamlede af en Sælfanger ved Barentz-Øerne under 76° 20', ligesom den af Heuglin i 1871 fandtes noget sydligere, i Matotskin Sharr; men den er hidtil ikke fundet ved Finmarkens Kyster. Derimod er den særdeles talrig i det hvide Hav, og fanges der i stort Antal, og bringes tiltorvs i Archangel. Den er fremdeles (ifølge Günther: Cat. Fish. vol. 4, p. 337) erholdt ved Island.

Endelig er den mer eller mindre talrig ved Grønland og i det arctiske America, hvor den er iagttaget under de fleste Expeditioner; Exemplarer fra Baffinsbugten, der i 1876 ere hjembragte til Universitets-Musæet af Hvalfangeren C. Brun, ere fuldkommen overensstemmende med de spitsbergenske Individer. I Americas Polartrakter gaar den ligesaa langt mod Nord, som i Europa, og er i 1876 hjembragt af den engelske Polar-Expedition fra Grinnell Land, under 82° 27' N. B.

In Europe, this species was taken by Parry, north of Spitzbergen (82° 40'); it is abundant in most localities on the shores of that group of islands, and has been observed in shoals between the fragments of ice in the fjords. The University Museum (Christiania) is in possesion of several specimens, taken off the Barentz Islands, in lat. 76° 20' N.; and Heuglin met with it (in 1871) a little farther south, at Matotskin Sharr; but it has not as yet been observed on the coast of Finmark. In the White Sea, the species is exceedingly abundant, being captured there in great numbers, and sent for sale to the Archangel market. According to Günther, it has been met with on the shores of Iceland.

Finally, it is a more or less common fish on the shores of Greenland and in the Artic regions of America, where it has been observed on most Expeditions. Specimens from Baffin's Bay, presented to the University Museum by the master of a whaler, C. Brun, correspond. in every respect with the examples obtained from the coast of Spitzbergen. In America, the range of the species extends as far north as in Europe, specimens having been taken on the English Polar Expedition (1876), off Grinnel Land, in lat. 82° 27' N.

Gen. Onos, Risso.

Hist. Nat. de l'Eur. Mér. tom 3, p. 214 (1826)[1].

26. Onos reinhardi, (Kr.) Mscr. 1852.

Pl. IV, Fig. 34.

? *Motella argentata*, Reinh., 1835—36, Kgl. D. Vid. Selsk. Nat. Math. Afh. 6 Del, p. CX, Kbhvn. 1837 (1835—36).
Motella mustela, Reinh. (nec Lin.) Kgl. D. Vid. Selsk. Nat. Math. Afh. 7 Del, p. 115 (1838). Uden Beskr.
Motella reinhardti, Kr. (en skreven Etiket i Musæet i Kbhvn., omtr. 1852). Uden Beskr.
? *Couchia argentata*, Günth. Cat. Fish. Brit. Mus. vol. 4, p. 363 (1862).
Onos reinhardii, Gill, Proc. Acad. Nat. Sci. Philad. 1863, p. 241 (1863). Uden Beskr.
Motella reinhardi, Coll. Forh. Vid. Selsk. Chra. 1878, No. 14, p. 83 (1878).

Diagn. *3 Skjægtraade (2 ved Næseborene, 1 paa Hagen). Snuden temmelig kort, har en Længde af omtrent 1½ Øjendiameter. Tænderne danne flere Rækker, hvoraf en enkelt har højere Tænder, end de øvrige. Hovedet indeholdes 5 Gange i Totallængden. 1ste Straale i 1ste Dorsal*

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[1] *Onos*, opstillet af Risso i 1826, har Prioriteten for *Motella*, der først forekommer i 2den Udgave af Cuviers „Règne Animal", som udkom i 1829. Begge Slægter have de samme Arter som Typer.

Gen. Onos, Risso.

Hist. Nat. de l'Eur. Mér. tom. 3, p. 214 (1826)[1].

26. Onos reinhardi, (Kr.) MS. 1852.

Pl. IV, fig. 34.

? *Motella argentata*, Reinh. Overs. 1835—36, Kgl. D. Vid. Selsk. Nat. Math. Afh. 6 Del, p. CX, Kbhvn. 1837 (1835—36).
Motella mustela, Reinh. Kgl. D. Vid. Selsk. Nath. Math. Afh. 7 Del, p. 115 (1838). No description.
Motella reinhardti, Kr. (from a manuscript label in the Zool. Mus. Copenh. about 1852). No description.
? *Couchia argentata*, Günth. Cat. Fish. Brit. Mus. vol. 4, p. 363 (1862).
Onos reinhardii, Gill, Proc. Acad. Nat. Sci. Philad. 1863, p. 241 (1863). No description.
Motella reinhardi, Coll. Forh. Vid. Selsk. Chra. 1878, No. 14, p. 83 (1878).

Diagnosis. — *Three barbels; 2 close to the nostrils, 1 on the chin. Snout rather short; its length is to the diameter of the eye about as 1½ to 1. Teeth arranged in several rows, those in one of the series being longer than the rest. Length of head about one-fifth of total length. First*

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[1] *Onos*, suggested by Risso in 1826, is entitled to rank before the synopym *Motella*, applied for the first time in the 2nd Edition of Cuvier's "Règne Animal," published in 1829. Both genera have the same species as types.

kort, kun ubetydeligt længere, end Snuden. Anus ligger midt mellem Snudespidsen og sidste Halehvirvel. Afstanden fra Snudespidsen til 2den Dorsal indeholdes 3,3 Gange i Totallængden. Ensfarvet rødgraa, med Skjægtraadene og Finnernes Spidser røde. Længden indtil 318 mm.

M. B. 7. D. 54—59; A. 45—46; P. 22—24; V. 8; C. 28.

Localit. fra Nordh. Exped. Havet vestenfor Beeren Eiland.

	Stat. 312.
Beliggenhed.	108 Kil. V. Beeren Eiland.
Dybde.	658 Favne (1203 m).
Temp. paa Bunden.	— 1.2° C.
Bunden.	Brunt og grønt Ler.
Datum.	22de Juli 1878.
Antal Indiv.	2 Indiv.

Bemærkninger til Synonymien. Denne Art, hvoraf Nordhavs-Expeditionen erholdt 2 Individer, kunde hidtil ikke opvise nogen Diagnose, og var ikke nogensinde bleven beskreven, endskjønt den allerede for omtr. 30 Aar siden erholdt det Navn, hvorunder den fremdeles opføres, og under hvilket den flere Gange er bleven omtalt. Henførelsen af Nordhavs-Expeditionens Individer under denne Art har derfor blot kunnet gjøres efter en umiddelbar Sammenligning med Typ-Exemplarerne i Kjøbenhavn.

Allerede i 1823 erholdt Musæet i Kjøbenhavn gjennem Holböll nedsendt et Exemplar af denne Art fra Grønland, og senere erholdtes yderligere 3, ligeledes fra Grønland. Det ene af disse, der er det største af alle, indsendtes den 24de Nov. 1836; af de øvrige bærer det ene Angivelsen 26de Aug. 1841; og det sidste er sandsynligvis indkommet omtrent samtidigt.

Først i 1838 findes et (det første) af disse Individer omtalt, nemlig i Reinhardt's Fortegnelse over Grønlands Fiske (Kgl. D. Vid. Selsk. Nat. Math. Afh. 7 Del, p. 115), men er her blot opført uden videre Angivelse som „*Motella mustela*, Lin. Holböll, Godthaab". Med Krøyer's Haandskrift er Reinhardt's Benævnelse paa det nævnte holböllske Exemplar senere rettet til *M. reinhardti*, hvilket Navn ogsaa er tildelt de øvrige Individer; under dette Navn er den ogsaa af Krøyer opført i den haandskrevne Catalog over Musæets grønlandske Fiskesamling, men uden at han nogetsteds har meddelt den nye Arts Diagnose eller Beskrivelse.

Den næste Gang, Arten findes omtalt, er i 1857 i Reinhardt's (jun.) „Naturhistoriske Tillæg til Rinks Grønlands Beskrivelse" (B. 2, Appendix p. 25), hvor den opføres med det af Krøyer givne Navn uden videre Diagnose eller Beskrivelse. Det er øjensynlig efter dette Skrift, at Arten i 1861 omtales af Gill i hans „Catal. Fishes East

ray in first dorsal short, being very little longer than snout. Vent placed midway between the point of the snout and the last caudal vertebra. Distance from snout to second dorsal is to total length as 1 to 3.3. Colour a uniform reddish-brown; cirri and fin-points red. Length reaching 318 mm.

M. B. 7. 2 D. 54—59; A. 45—46; P. 22—24; V. 8; C. 28.

Locality (North Atl. Exped.): — The open sea west of Beeren Eiland.

	Stat. 312.
Exact Locality.	108 Kil. W. of Beeren Eiland.
Depth.	658 Fathoms (1203 m).
Temp. at Bottom.	— 1.2° C.
Bottom.	Brown & green Clay.
Date.	22th July, 1878.
Numb. of Specim.	2 Indiv.

Remarks on the Synonymy. — This species, of which two examples were obtained on the North Atlantic Expedition, had not previously been diagnosticated at all, and never once described, notwithstanding it was given the name by which it is still known, and under which it has been repeatedly recorded, upwards of 30 years ago. Hence the identification of the two individuals taken on the Expedition necessarily involved a direct, autoptical comparison with the typical specimens preserved in Copenhagen.

In 1823, the Zoological Museum at Copenhagen first came into possession of an example of this species, sent from Greenland by Holbøll; and subsequently three other specimens were obtained, likewise from Greenland. One of these individuals reached its destination Nov. 24th 1836; of the other two, one bears date Aug. 26th 1841, and the third probably came to hand about the same time.

No one of these examples was recorded till 1838, when Reinhardt included one of them in his List of Greenland Fishes (Kgl. D. Vid. Selsk. Nat. Math. Afh. 7 Del; p. 115), merely recording it however, without further remark, as "*Motella mustela*, Lin. Holböll, Godthaab." Reinhardt's designation for this specimen was afterwards corrected, in Kröyer's handwriting, to *M. reinhardti*, and this name also assigned to the other individuals; with this name, too, Kröyer has classed the species in his manuscript Catalogue for the Collection of Greenland fishes, but without having anywhere furnished a diagnosis or description of the new species.

The species was next recorded in 1857, by Reinhardt jun., in his "Naturhistoriske Tillæg til Rinks Grønlands Beskrivelse" (B. 2, Appendix p. 25), where it is classed with the synonym given by Kröyer, no diagnosis or description, however, being annexed. It was obviously to this work Gill had recourse in 1861, when recording

Coast North America from Greenl. to Georgia" (Proc. Acad. Nat. Sci. Philad. 1861, Append. p. 48) under Navnet *Motella reinhardi*, Kr., fremdeles af samme Forfatter i 1863 i hans "Synopsis of the North America Gadoid Fishes" (samme Tidsskr. f. 1863, p. 241) under Navn af *Onos reinhardii*, Gill, samt endelig 1873 i den reviderede Catalog af 1861, der er indtaget i U. S. Fish Commission, Report 1871—72, p. 796 (Wash. 1873).

Gill giver iøvrigt ingen anden Oplysning om Arten, end følgende Ord, tilføjede i hans "Synopsis": "Closely related to the *O. mustela*, of Europe, and agreeing in having five barbels, one to each nostril, and one at the chin," en Diagnose, som det vil sees, er ganske ucorrect.

Den sidste Gang, Arten findes omtalt, er i 1875 i Lütken's "Revised Catalogue of the Fishes of Greenland" (Man. Nat. Hist. etc. Greenl., prep. for the Arct. Exped. of 1875). Den kaldes her *Motella reinhardti*, Kr., men er, ligesom de øvrige i Fortegnelsen opregnede Arter, ikke meddelt Diagnose eller Beskrivelse.

Flere end de 4, i Kjøbenhavns zoologiske Musæum opbevarede (udvoxede) Individer have hidtil ikke været fundne. Opdagelsen af 2 nye Exemplarer, der desuden for første Gang optræde paa det europæiske Gebet, er derfor ikke uden Interesse.

Endskjønt det ikke er i Overensstemmelse med Prioritetslovenes strengeste Principer, at en Arts Benævnelse blot begrundes ved et i en Catalog og paa en Etikette nedskrevet Navn, bør Arten dog fremdeles opføres under dette hidtil benyttede Navn, der ikke kan volde nogen Forvirring; dog lader dette Navn sig ikke med fuld Sikkerhed henføre til det bestemte Aar, 1852.

Imidlertid omtaler Reinhardt i en af sine tidligere Meddelelser om Grønlands Fiske en anden Art, som han kalder *Motella argentata*, der øjensynlig udgjør Ungdomsstadiet af en af de 3-traadede Moteller (*O. reinhardi*, eller *O. ensis*). Af *M. argentata* erholdt Reinhardt i Aarene 1831—36 fra Syd-Grønland, især fra Julianehaabs District, talrige Exemplarer, der samtlige havde en jevn Størrelse af 2 Tom. 7 Lin., til 2 Tom. 11 Linier. I Oversigten for 1835—36 af Danske Vidensk. Selskabs Skrifter characteriserer Reinhardt *M. argentata* ved dens „sølvblanke Farve, det forrelagtige stumpe Hoved, og især ved den fladt indskaarne Halefinne". I 1838 giver han i 7de Del af samme Selskabs Skrifter, p. 128, yderligere en Del Bemærkninger om denne Art, der omtales som bærende 2 Hudtrevler paa Snuden, og 1 paa Hagen; Gjællestraalernes Antal var 7, Appendices pyloricae 8; Svømmeblære manglede. Tydelige Forplantningsorganer fandtes ikke hos de aabnede Exemplarer.

Efter den Undersøgelse af disse i Kjøbenhavns zoologiske Musæum endnu opbevarede talrige Individer af *M. argentata* samt af 4 i Berliner- og Wiener-Musæet, i sin Tid sendte af Reinhardt, som jeg i 1878 og 1879 havde Anledning til at foretage, fandtes deres Størrelse at være mellem 70 og 80^{mm}, hvoraf Hovedets Længde indeholdtes

the species in his "Catal. Fishes. East Coast North America from Greenl. to Georgia" (Proc. Acad. Nat. Sci. Philad. 1861, Append. p. 48), by the name of *Motella reinhardi*, Kr.; also (1863) for his "Synopsis of the North American Gadoid Fishes" (same journal for 1863, p. 241), where it is termed *Onos reinhardii*, Gill; and finally (1873), for the revised Catalogue of 1861, inserted in U. S. Fish Commission. Report 1871—72, p. 796 (Wash. 1873).

All that Gill says about the species is contained in the following words in his Synopsis: — "Closely related to the *O. mustela* of Europe, and agreeing in having five barbels, one to each nostril, and one at the chin," — as will be seen, a diagnosis absolutely incorrect.

This species was last noticed in Lütken's "Revised Catalogue of the Fishes of Greenland" (Man. Nat. Hist. etc. Greenland, prep. for the Arct. Exped. of 1875). Here it bears the name of *Motella reinhardti*, but, like the other species enumerated in the List, without being made the subject of any diagnosis or description.

Other individuals, exclusive of the 4 full-grown preserved in the Zoological Museum, Copenhagen, have not as yet been observed. Hence, this addition to the extant specimens of the species, and moreover from within the European limits of its range, cannot but prove of interest.

It is not indeed in strict accordance with the principles determining the right of priority, that the designation of a species should be derived solely from a name taken from a manuscript label or a Catalogue; but it will be best to retain the synonym hitherto employed, seeing that no confusion can arise from so doing; this name, however, will hardly admit of being referred to the year 1852.

But Reinhardt records in one of his earlier communications on the fishes of Greenland another species, "*Motella argentata*," clearly one of the three-bearded species (*O. reinhardi* or *O. ensis*) in an early stage of growth. Of *M. argentata* Reinhardt obtained, during the period extending from 1831 to 1836, from South Greenland, chiefly from the distinct of Julianehaab, numerous examples, all of which averaged in length from 2 inch. 7 lines to 2 inch. 11 lines. In the "Oversigt" of the Proceedings of the "Danske Vidensk. Selskab," Reinhardt characterises *M. argentata* by its "bright silvery hue, obtuse head, resembling that of the trout, and more especially by the slightly forked caudal fin." In 1838, he communicated in Part 7 of the Proceedings of the said Society, p. 128, divers supplementary observations on this species, which is stated to have 2 cirri on the snout, and 1 on the chin. Brancheostegous rays 7; pyloric appendages 8; swimming-bladder wanting. On dissection, no trace of sexual characters could be detected.

From an examination which I had opportunity of making in 1878 and 1879 of numerous specimens of *M. argentata* still preserved in the Zoological Museum of Copenhagen (and of 4 in the Museums of Berlin and Vienna, originally sent by Reinh. sen.), their extreme length may be given as averaging between 70^{mm} and 80^{mm}, to which the

$5-5\frac{1}{2}$ Gange i Totallængden; den første Straale i 1ste Dorsal udgjorde $\frac{1}{3}$ af Hovedlængden. Afstanden mellem Snudespidsen og 2den Dorsal indeholdtes omtrent 3,5 Gange i Totallængden. Skjælbeklædningen var endnu ikke fuldstændig, idet den paa Legemets forreste Del øjensynlig endnu blot var i Frembrud. At *M. argentata* blot er en Ungform, er især paa Grund af det sidstnævnte Factum øjensynligt, og det ligger vistnok nærmest at antage den for Ungen af *O. reinhardi*. Dette Spørgsmaal kan ikke afgjøres, førend sikre Ungdomsstadier af de 2 nærstaaende Arter, *O. reinhardi* og *O. ensis*, blive kjendte.

Viser det sig altsaa i Fremtiden, at Reinhardt's *Motella argentata* udgjør Ungformen af *O. reinhardi*, vil Artens rette Navn følgelig blive *Onos argentatus*, (Reinh.) 1838.

Den nævnte anden Art, *Onos ensis*, er den, som *O. reinhardi* i sin udvoxede Stand utvivlsomt staar nærmest. *O. ensis* er ligeledes en grønlandsk Form, og opstilledes af Reinhardt (samtidigt med *Motella argentata*) i Overs. 1835—36 af det oftere nævnte Selskabs Forhandlinger, 6 Del, p. CX, og senere i 7de Del, p. 116 og 128 (Kbhvn. 1837), efter 2 Individer, der i noget beskadiget Stand i 1834 vare udtagne af Ventrikelen af en *Cystophora cristata* ved Omenak (70° N. B.).

Den af Reinhardt paa de ovenanførte Steder givne korte Characteristik er dog saa ufuldkommen, at Dr. Günther ikke deraf har kunnet opstille nogen Diagnose, og Arten findes derfor i 1862 i hans Cat. Fish. Brit. Mus. ikke optagen som selvstændig Art (vol. 4, p. 366). De 2 originale Exemplarer, der endnu opbevares i det zoologiske Musæum i Kjøbenhavn, ere fremdeles, saavidt vides, de eneste, som existere, og de have hidtil ikke været Gjenstand for nøjagtigere Undersøgelse og Beskrivelse. Ingen af Arterne har hidtil været afbildet.

Ved den flygtige Gjennemgaaelse af denne og de øvrige nærstaaende Former, som jeg ved Dr. Lütkens Velvillie havde Lejlighed til at foretage i October 1878, viste det sig strax, at *O. ensis* og *O. reinhardi* ere fuldkommen distincte, om end beslægtede Arter. De mest iøjnefaldende Characterer hos *O. ensis* ligge i den stærkt forlængede 1ste Straale i 1ste Dorsal, det mindre Hoved, og den svagere Tandvæbning. Totallængden hos de 2 Individer var omtrent 310mm og 392mm.[1]

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[1] **Onos ensis,** (Reinh.) 1835—36.

Overs. 1835—36, Kgl. D. Vid. Selsk. Naturv. Math. Afh. 6 Del, p. CX, Kbhvn. 1837 (1835—36).

3 Skjægtraade; Hovedet indeholdes omtrent $5\frac{3}{4}$ Gange i Totallængden; 1ste Straale i 1ste Dorsal lang, omtrent af Hovedets Længde. Tænderne forholdsvis svage og ensartede. Anus ligger midt mellem Snudespidsen og Begyndelsen af Caudalen. Afstanden fra Snudespidsen til 2den Dorsal indeholdes 3,7 Gange i Totallængden.

2 D. 59; A. 45—46; P. 22—23.

Til Sammenligning kan vedføjes følgende Maal af et Par omtrent lige store Individer af de 2 Arter, begge fra Musæet i Kjøbenhavn.

length of the head, bears the proportion of $5-5\frac{1}{2}$. First ray in first dorsal one-third of the length of the head. Distance from point of snout to second dorsal is to total length as 1 to 3.5. The scales not yet fully developed; on the anterior part of the body indeed almost incipient. Hence, *M. argentata* must represent one of the earlier stages of growth, in which case it comes nearest to *O. reinhardi*. This question cannot, however, be decided until the stages through which the two closely related species, *O. reinhardi* and *O. ensis*, pass before reaching maturity, have become known.

Should future researches show that Reinhardt's *M. argentata* is merely *O. reinhardi* in an early stage of development, the name of the species will be *Onos argentatus*, (Reinh.) 1838.

Onos ensis is unquestionably the species presenting the closest resemblance to *O. reinhardi* in its adult stage of development. *O. ensis* is likewise a Greenland form; it was described by Reinhardt (along with *Motella argentata*) in Overs. 1835—36, Kgl. D. Vid. Selsk. Afh. D. 6, p. CX, and subsequently in Part 7, pp. 116 and 128 (1837), his specimens being two individuals, in a somewhat mutilated condition, which had been taken in 1834 from the stomach of a *Cystophora cristata*, near Omenak, in lat. 70° N.

The brief characterisation furnished by Reinhardt is very imperfect however, so much so indeed that Dr. Günther could not elaborate from it a diagnosis; and the species figures as undetermined in his "Cat. Fish. Brit. Mus." (vol. 4, p. 366), published 1862. The two original individuals still preserved in the Zoological Museum in Copenhagen, are the only specimens known to exist, and up to the present time they have not been accurately examined and described. Neither of the species has hitherto been figured.

The cursory examination of this and the other nearly related forms which, thanks to the kindness of Dr. Lütken, an opportunity was afforded me of making in October 1878, conclusively proved the specific distinction existing between the congeners *O. ensis* and *O. reinhardi*. The most conspicuous characters in *O. ensis* are the produced first ray in the first dorsal fin, the small size of the head, and the feeble dentition. Total length in the two specimens, respectively 310mm and 392mm.[1]

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[1] **Onos ensis;** (Reinh.) 1835—36.

Overs. 1835—36, Kgl. D. Vid. Selsk. Naturv. Math. Afh. 6 Del, p. CX, Kbhvn. 1837 (1835—36).

Three barbels; length of head is to total length as 1 to $5\frac{3}{4}$. First ray in 1st dorsal produced, its length equalling that of the head. Teeth comparatively feeble, and uniform. The vent placed midway between the snout and the commencement of the caudal fin. Distance from point of snout to 2nd dorsal is to total length as 1 to 3.7.

2 D. 59; A. 45—46; P. 22—23.

For comparison are appended measurements of two individuals, about equal in size, of the two species — both specimens preserved in the Zoological Museum in Copenhagen.

Da *O. reinhardi* saaledes hidtil ikke er bleven beskreven, meddeles en Beskrivelse efter de 2 foreliggende Exemplarer, hvoraf det ene sandsynligvis er fuldvoxent, sammenholdte med de i Kjøbenhavner-Musæet opbevarede Typ-Exemplarer.

Udmaalinger.

	a.	*b.*
Totallængde	254 mm	293 mm
Hovedets Længde	49 -	59 -
Øjets Diameter	9 -	11 -
Snudens Længde	14 -	15 -
Hovedets postorbitale Del	27 -	34 -
Legemets Højde	40 -	45 -
Snudespidsen til 1ste Dorsal	46 -	55 -
Snudespidsen til 2den Dorsal	77 -	88 -
Snudespidsen til Anus	117 -	142 -
Anus til sidste Halehvirvel	117 -	130 -
Anus til Spidsen af Caudalen	143 -	159 -
Anus til Begyndelsen af Caudalen	109 -	113 -
Halerodens Højde	14 -	17 -
Interorbitalrummets Bredde	11 -	15 -
Pectoralernes Længde	37 -	44 -
Ventralernes Længde	49 -	49 -
Længden af 1ste Straale i 1ste Dorsal	16,5 -	18 -

Beskrivelse. *Legemsbygning.* Legemet er langstrakt; dets Højde, naar Bugen ikke er slap eller udspilet, er næsten, men ikke fuldt lig Hovedets Længde, og indeholdes omtrent $5^3/_4$ Gange i Totallængden.

Hovedet er forholdsvis lidet, med temmelig jevnt afrundet Profil, og stærke, muskuløse Kinder; dets Længde udgjør hos 4 Individer 4,8, hos 1 Individ 4,9, hos 1 (det mindste) 5,1 af Totallængden.

Underkjæven er kortere, end Overkjæven; Mundspalten er af middels Længde, idet Overkjæven strækker sig tilbage omtrent ret under Bagranden af Øjet (eller hos et yngre Individ ikke fuldt saa langt).

Tænderne ere tilstede i Mellemkjæverne og i Underkjæven, samt paa Vomer; overalt danne de flere Rækker, hvoraf en enkelt rager op over de øvrige; denne Række sidder i Mellemkjæven forrest, i Underkjæven inderst, paa Vomer omtrent i Midten.

Snuden har paa hver Side 1 Skjægtraad, fæstet til den bagre Rand af det forreste Næsebor; en tredie Traad findes paa Hagen.

Gjællehindens Straaler ere 7 i Antal.

Øjnene ere forholdsvis store, lateraltstillede; Længdediameteren indeholdes ikke fuldt $1^1/_2$ Gang i Snudens

	O. reinhardi.	*O. ensis.*
Totallængden	318 mm	310 mm
Hovedets Længde	66 -	52 -
Overkjævens Længde	30 -	22,5 -
Fra Snudespidsen til Beg. af 2den Dorsal	96 -	83 -
Længden af 1ste Straale i 1ste Dorsal	20 -	45 -

O. reinhardi having accordingly not as yet been diagnosticated, a description is given here, from a careful examination of the two specimens obtained, one of which, probably, is an adult (compared to the typical examples preserved in the Copenhagen Museum).

Measurements.

	a.	*b.*
Total length	254 mm	293 mm
Length of head	49 -	59 -
Diameter of eye	9 -	11 -
Length of snout	14 -	15 -
Postorbital region of head	27 -	34 -
Depth of body	40 -	45 -
From point of snout to first dorsal	46 -	55 -
From point of snout to second dorsal	77 -	88 -
From point of snout to vent	117 -	142 -
From vent to last caudal vertebra	117 -	130 -
From vent to extremity of caudal	143 -	159 -
From vent to commencement of caudal	109 -	113 -
Depth of tail at base	14 -	17 -
Interorbital space	11 -	15 -
Length of pectorals	37 -	44 -
Length of ventrals	49 -	49 -
Length of 1st ray in 1st dorsal	16.5 -	18 -

General Description. *Structure of the Body.* — Body elongated; depth, when the abdomen is neither relaxed nor distended, almost equal to the length of the head, being to total length about as 1 to $5^3/_4$.

Head comparatively small, the upper profile-line rounded; cheeks strong and muscular; length of head, in 4 individuals, is to total length as 1 to 4.8; in 1 individual, as 1 to 4.9; in the smallest, as 1 to 5.1.

Lower jaw shorter than upper; mouth of moderate length, the upper jaw extending backwards almost under the posterior margin of the eye (in a younger example not quite so far).

Teeth on intermaxillaries, in lower jaw, and on the vomer; on each bone several rows, one with longer teeth than the rest; on the intermaxillaries this row is the outermost, in the lower jaw the innermost, on the vomer the medial series.

On either side of the snout 1 barbel, attached to the posterior margin of the foremost nostril; a third barbel on the chin.

Brancheostegous rays 7.

Eyes comparatively large, position lateral; the longitudinal diameter of the eye is to the length of the snout very

	O. reinhardi.	*O. ensis.*
Total length	318 mm	310 mm
Length of head	66 -	52 -
Length of upper jaw	30 -	22.5 -
From point of snout to com. of 2nd dorsal	96 -	83 -
Length of 1st ray in 1st dorsal	20 -	45 -

Længde, og omtrent $5^1/_2$ Gange i Hovedlængden. Interorbitalrummet er forholdsvis smalt, eller ubetydeligt større, end Øjendiameteren.

Anus ligger midt mellem Snudespidsen og sidste Halehvirvel; Halerodens Højde er omtrent lig Snudens Længde (Hovedets præorbitale Del).

Finnerne. 1ste Dorsals-Grundlinie er forholdsvis lang, omtrent lig Længden af Hovedets postorbitale Del; dens 1ste forlængede Straale er ubetydeligt større, end Halerodens Højde, eller Snudens Længde, og er næsten lig 2 Gange Øjets Diameter.

2den Dorsal, der tæller hos det mindre Exemplar 54, hos det større 59 Straaler, udspringer i næsten en Øjendiameters Afstand fra 1ste Dorsal, og i en Afstand fra Snudespidsen, der omtrent svarer til Gjællespaltens Afstand fra Anus. Den er omtrent jevnhøj; dog ere de bagre Straaler noget længere, end de forreste. Afstanden fra den sidste Dorsalstraale til Hvirvelsøjlens Ende svarer omtrent til Afstanden fra Snudespidsen til Bagranden af Øjet.

Analen, der tæller hos det mindre Exemplar 45, hos det større 46 Straaler, udspringer umiddelbart bag Anus, og ophører ubetydeligt foran Verticalen fra Slutningen af 1ste Dorsal. Dens Bygning og Højde er ganske, som hos den sidstnævnte Finne.

Pectoralerne tælle 22—24 Straaler, ere forholdsvis brede, og have de nedre Straaler kortest; deres Længde er noget større, end Afstanden fra Øjets forreste Rand til Gjællespalten.

Ventralerne tælle 8 Straaler; den anden fra oven er forlænget, saaledes at Finnens største Længde omtrent bliver lig Hovedlængden, hos det mindre Exemplar endog større end denne. Den første Straale er omtrent $^2/_3$ saa lang, som 2den. Tilbageslaaet naar Finnens Spidse hos det yngre Individ bagenfor Pectoralernes Spidse, og er her blot en halv Finnelængde fjernet fra Anus; hos det ældre Individ ere Straalerne forholdsvis kortere, naa ikke fuldt Pectoralernes Spidse, og ere næsten i en Finnelængdes Afstand fjernede fra Anus.

Caudalen er svagt afrundet, og tæller omtrent 28 lange Straaler, foruden et Antal kortere Støttestraaler paa begge Sider af Roden. Dens største Længde, regnet fra sidste Halehvirvel, er omtrent lig Længden af Hovedets postorbitale Del.

Sidelinien og Slimporer. En fuldstændig Sidelinie er tilstede, men Porerne ere, som hos alle Moteller, stillede med temmelig langt Mellemrum indbyrdes. Den strækker sig fra Gjællespaltens øvre Rand først i noget skraa Retning opad, men bøjer noget bag Begyndelsen af 2den Dorsal skraat nedad mod Legemets Midtlinie, som den naar omtrent ret over Begyndelsen af Analen; herfra følger den Midtlinien ret ud til Caudalen. Antallet af Porer er omtrent 27; paa Legemets bagre Del ere Mellemrummene mellem disse større, end fortil.

Af de Rækker Slimporer, som udbrede sig over Ho-

nearly as 1 to $1^1/_2$, to the length of the head about as 1 to $5^1/_2$. Interorbital space but slightly exceeding the diameter of the eye.

The vent midway between the point of the snout and the last caudal vertebra; depth of tail at base about equal to the length of the snout (preorbital region of the head).

Fins. — Base of first dorsal long, about equal in length to the postorbital region of the head; the first elongated ray slightly exceeding in length the depth of the tail at base, or the length of the snout, or about equal to twice the diameter of the eye.

Second dorsal — in the smaller specimen with 54, in the larger, with 59 rays — is distant at its commencement the length of the diameter of the eye from the first, its distance from the point of the snout being about equal to that between the branchial opening and the vent. Depth nearly uniform, the posterior rays however slightly exceeding in length those in the anterior part of the fin. The distance from the last dorsal ray to the termination of the vertebral column about equal to that between the snout and the posterior margin of the eye.

The anal — in the smaller example with 45, in the larger with 46 rays — commences immediately behind the vent, terminating a little in advance of the last ray of first dorsal. Depth and structure as in that fin.

The pectorals, furnished each with 22—24 rays, comparatively broad; lower rays shortest; length slightly exceeding the distance from the anterior margin of the eye to the branchial opening.

The ventrals furnished with 8 rays; second anterior ray elongated, the length of the fin about equalling the length of the head; in the smaller specimen exceeding it even. The second ray longer than the first by about two-thirds. Spread backwards, the tip of the fin, in the younger specimen, reaching beyond the extremity of the pectorals, at which point it is removed not more than half the length of the fin from the vent; the rays in the older individual relatively somewhat shorter, not quite reaching the extremity of the pectorals, and removed almost the length of the fin from the vent.

The caudal slightly convex, furnished with 28 long rays, exclusive of a number of shorter rays protending along both sides of the base. Length, measured from the last caudal vertebra, about equal to that of the postorbital region of the head.

Lateral Line and Mucous Pores. — A lateral line, distinct throughout its entire length, extends from the upper margin of the gill-opening, at first somewhat obliquely upwards, but slants off at the commencement of the second dorsal in the direction of the mesial line, which it meets almost immediately above the origin of the anal, passing from thence straight along the said line to the caudal. Number of pores about 27; on the posterior part of the body, the spaces between are larger than in the anterior region.

Of the several series of mucous pores disposed over

vedet, ere følgende de mest iøjnefaldende. En Række af omtrent 9 Porer strækker sig fra Snudespidsen langs Randen af Overkjæven indtil bagenfor Mundvinkelen. Fra den sidste af disse Porer stiger vertikalt nedad en Række finere Porer, oftest 4 i Antal, indtil den nedre Rand af Praeoperculum; herfra fortsætter sig en Række af omtrent 6 grovere Porer langs Randen af Praeoperculum bagover og opover, indtil den standser omtrent i Højde med Gjællespaltens øvre Ende. Endelig strække sig langs Underkjæven 2 næsten parallelle Rækker, den indre med 5 mindre, den ydre med 3 grovere Porer. Mellem Øjnene danne 3 (ligeledes grovere) Porer en fortil aaben Vinkel. Paa Siderne af Panden strækker sig fra Øjet hen til Gjællespaltens øvre Ende en Række af 4 Porer. Iøvrigt findes spredte Porer paa Panden, ligesom ogsaa Antallet i de normale Rækker viste sig at være noget varierende hos de 2 undersøgte Individer.

Skjælbeklædning. Skjællene ere udbredte over hele Legemet. Paa Hovedet strækker Skjælbeklædningen sig frem indtil mellem de bagre Næsebor, hvorimod selve Snuden er nøgen; paa Hovedets Underside er Skjælbeklædningen ligeledes udbredt overalt paa den ubedækkede Del af Gjællehinden indtil selve Spidsen af Underkjæven, der er nøgen. Paa Dorsalen og Analen strække Skjællene sig ud næsten lige til Spidsen af Straalerne; paa Pectoralerne findes de blot ved Roden.

Farve. Farven var i levende Live rødgraa, paa Hovedet og Bugen gaaende over i blaagraat; paa Hovedets Underside strækker denne Farve sig frem overalt paa Gjællehindens ubedækkede Dele. Spidsen af Dorsalen, Analen, og Caudalen vare smukt røde; samme Farve havde de 3 Skjægtraade, samt den første forlængede Straale i 1ste Dorsal. Pectoraler og Ventraler vare hos det ene Exemplar i Spidsen røde, hos det andet blaalige med lysere Spidser. Mundhulen var hvid. Efterat Individerne have været opbevarede paa Spiritus, er Farven bleven mere ensfarvet rødgraa overalt; Hovedets Skjægtraade, samt 1ste Dorsalstraale have tabt sin røde Farve, hvilket ogsaa er Tilfældet med Ventralerne og tildels med Pectoralerne. De sidste have derimod faaet lysere Pletter paa den rødlige eller blaalige Bund.

Føde. I Ventrikelen af det ene Individ fandt jeg Skelettet af en liden Fisk, hvis Længde var omtrent 100mm; en sølvglindsende Svømmeblære var dog endnu tilstede, men Arten lod sig ikke bestemme, da Hovedet var næsten fortæret. Desuden fandtes diverse Stykker af Decapoder, som det synes, af Hippolyter.

Det andet Individ havde Ventrikelen fyldt af *Themisto libellula*, en Amphipode af Hyperidernes Familie, der saaledes trænger ned til en anselig Dybde, skjønt den maa ansees for at have sit Hovedtilhold i de højere Vandlag; fremdeles en *Anonyx*, sandsynligvis *A. lagena*.

Udbredelse. Foruden Nordhavs-Expeditionens 2 Individer fra Havet mellem Spitsbergen og Beeren Ejland ere,

the surface of the head, the following are the most conspicuous: — A row, composed of about 9 pores, extending from the point of the snout along the margin of the upper jaw a little behind the angle of the mouth. Branching vertically downwards from the last of these pores, a series of about 4 smaller pores is seen extending to the lower margin of the preoperculum; from this point a series of about 6 large pores runs along the margin of the preoperculum, backwards and upwards, terminating in a line with the upper extremity of the gill-opening. On the lower jaw occur two rows almost parallel, the inner composed of 5 small, the outer of 3 large, pores. Between the eyes are 3 pores (these, too, comparatively large), marking off an angular space, open anteriorly. On either side of the forehead, from the eye to the upper extremity of the branchial opening, extends a row of 4 pores. Moreover, isolated pores occur on the forehead; and the number in the normal series varies somewhat in the 2 individuals examined.

Scales. — The scales cover the entire surface of the body. On the head, they extend forwards between the posterior nostrils, leaving the snout naked; on the under surface of the head, they likewise envelop the whole of the uncovered portion of the branchial membrane, saving the extreme point of the lower jaw, which is naked. On the dorsal and anal, the scales extend almost to the points of the rays; on the pectorals, they occur only on the base.

Colour. — Colour in live examples reddish-grey, changing to bluish-grey on the head and abdomen; the latter shade extends, too, over the whole of the uncovered portion of the branchial membrane. Tips of dorsal, anal, and caudal of a fine red; this colour likewise distinguishing the barbels and the first elongated ray in first dorsal. Tips of pectorals and ventrals in one example red; in the other, the tips were bluish. Cavity of the mouth white. The specimens having been preserved some time in spirits, the colour has changed to a more uniform reddish-grey; the barbels and the first dorsal ray have lost their brilliant red colour; this is the case too with the ventrals, and, to some extent, with the pectorals; in the latter, the reddish or bluish ground has become flecked with lighter spots.

Food. — In the ventricle of one of the individuals was the skeleton of a small fish, length about 100mm; the swimming-bladder, of a silvery lustre, was still present, but the head being very nearly digested, there was no means of determining the species; the stomach also contained divers fragments of Decapods, apparently of the genus *Hippolyte*.

The other individual had the ventricle distended with *Themisto libellula*, of the family *Hyperidæ*, a species descending therefore to a considerable depth, though its true habitat has been held to be exclusively the upper strata of the ocean; an *Anonyx*, probably *A. lagena*, was also found.

Distribution. — Exclusive of the two individuals taken on the North Atlantic Expedition between Spitzbergen and

som tidligere nævnt, blot kjendte 4 udvoxede Individer, der alle vare erholdte ved Kysterne af Grønland i Aarene mellem 1823 og 1841, og som ere opbevarede i Musæet i Kjøbenhavn.

Nordhavs-Expeditionens nye Individer optoges fra betydeligt Dyb (mellem 600 og 700 Favne), og fra det iskolde Vand.

Hertil kommer et Antal Ungdomsformer (*Motella argentata*, Reinh.), der, efter hvad ovenfor er udviklet, med høj Grad af Sandsynlighed tilhøre denne Art, og som ligeledes ere erholdte ved Grønland i Aarene 1830—1840, og hvoraf de fleste opbevares i Musæet i Kjøbenhavn, enkelte i Musæerne i Berlin og Wien.

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27. Onos septemtrionalis, (Coll.) 1874.

Pl. IV, Fig. 35—36.

Motella septemtrionalis, Coll. Ann. Mag. Nat. Hist. Ser. 4. vol. 15, p. 82, Nov. 1874 (1874).

Diagn. *3 Skjægtraade (2 paa Næseborene, 1 paa Hagen), samt en Række af 8 kortere, tildels rudimentære Traade langs Overlæben. Øjnene forholdsvis smaa, indeholdes (hos ældre Individer) 2 Gange i Snudens Længde. Mundspalten strækker sig bagover langt bagenfor Øjnene. Tænderne temmelig smaa, af ulige Størrelse. Hovedet indeholdes ubetydeligt over 4 Gange i Totallængden. 1ste Straale i 1ste Dorsal kort, omtrent lig Snudens Længde. Anus ligger midt mellem Snudespidsen og sidste Analstraale. Sidelinien synlig, med omtrent 20 store Porer. Farven ensartet graabrun. Totallængden (hos det største undersøgte Individ) 173mm.*

M. B. 7. 2 D. 49—52; A. 41—43; P. 15—16;
V. 7; C. 28—30.

Localit. for Nordh. Exped. Røst, ved Indløbet til Lofoten (Norge).

Beliggenhed.	Røst, Lofoten (Norge).
Dybde.	50 Favne (91m).
Temp. paa Bunden.	+ 5° C.
Bunden.	Sandbund.
Datum.	26de Juni 1877.
Antal Indiv.	1 Unge.

Bemærkninger til Synonymien. *O. septemtrionalis*, der opstilledes i 1874 efter 2 Exemplarer fra Norges Vestkyst (det største med en Totallængde af omtr. 6½ Tomme,

Beeren Eiland, 4 full-grown specimens only are known to exist of this species, which, as previously stated, were all obtained off the coast of Greenland; they are preserved in the Zoological Museum at Copenhagen.

The individuals last obtained were taken at a considerable depth (6—700 fathoms), and in water of the temperature of ice.

There occur besides a number of forms in the earlier stages of growth (*Motella argentata*, Reinh.), which, as explained above, may be referred with a high degree of probability to the species in question; the specimens of these, too, were taken on the coast of Greenland (1830—1840), and are most of them preserved in the Copenhagen Museum, some in the Museums of Berlin and Vienna.

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27. Onos septemtrionalis, (Coll.) 1874.

Pl. IV, fig. 35—36.

Motella septemtrionalis, Coll. Ann. Mag. Nat. Hist. Ser. 4, vol. 15, p. 82, Nov. 1874 (1874).

Diagnosis. — *Three barbels (2 at the nostrils, 1 on the chin), and a row of shorter, in part rudimentary barbels along the upper lip. Eyes comparatively small, their diameter (in mature individuals) half the length of the snout. The angle of the mouth extending backwards far beyond the eyes. Teeth rather small, of unequal size. The head is contained a little more than 4 times in the total length. First ray in first dorsal short, about equal to the length of the snout. The vent placed midway between the point of the snout and the last anal ray. Lateral line obvious, composed of about 20 large pores. Colour a uniform greyish-brown. Total length (in the largest individual examined) 173mm.*

M. B. 7. 2 D. 49—52; A. 41—43; P. 15—16;
V. 7; C. 28—30.

Locality (North Atl. Exped.): — Røst, Inlet to Lofoten (Norway).

Exact Locality.	Røst, Lofoten (Norway).
Depth.	50 Fathoms (91m).
Temp. at Bottom.	+ 5° C.
Bottom.	Sand.
Date.	26th June 1877.
Numb. of Specim.	1 Indiv. (young).

Remarks on the Synonymy. — *O. septemtrionalis*, described in 1874, from 2 examples taken on the west coast of Norway (length of the largest about 6½ inches, or

(eller 173 mm), har hidtil ikke været kjendt fra andre Punkter, end fra de norske Kyster[1]. Imidlertid har jeg i 1878 havt Lejlighed til at undersøge et Exemplar af denne Art, der under et provisorisk, med Kröyer's Haandskrift (omtr. 1852) vedføjet Navn opbevares i den grønlandske Samling i Musæet i Kbhvn., men som aldrig hidtil har været omtalt.

Beskrivelse. *Legemsbygning.* Fra alle de øvrige Arter af denne Slægt kan denne kjendes ved sit relativt store Hoved med de lange Kjæver, samt ved en Række af rudimentære Skjægtraade (foruden de normale) langs Overlæben. Jeg gjengiver her Artens oprindelige Beskrivelse, med de Supplementer, som de senere fundne Exemplarer have foranlediget, og giver tillige en ny Afbildning af Typ-Exemplaret.

De Individer, alle fra de norske Kyster, der have foreligget til Undersøgelse, have havt følgende Maal og Straaleantal:

	a. Røst, Aug. 1877.	b. Bodø, Aug. 1874.	c. Florø, Juli 1873.
Totallængde	69 mm	100 mm	173 mm
Hovedets Længde	16,8 -	24,5 -	42 -
Straaler i 2den Dorsal	49 -	49 -	52 -
Straaler i Analen	43 -	41 -	43 -
Straaler i Pectoralerne	16 -	15 -	16 -

Legemet er forholdsvis kort og sammentrængt; dets Højde, der er betydeligt kortere end Hovedlængden, indeholdes omtrent $5\frac{2}{3}$ Gange i Totallængden.

Anus ligger næsten nøjagtigt midt mellem Underkjævens Spidse og Slutningen af Analen. Haleroden har en Højde, der er lig Interorbitalrummets Bredde, og indeholdes næsten 3 Gange i Overkjævens Længde.

Hovedet er stort, stærkt fladtrykt ovenfra og nedenfra, og med tykke, muskuløse Kinder; dets Længde indeholdes ubetydeligt over 4 Gange i Totallængden. Underkjæven er kortere end Overkjæven.

Mundspalten er særdeles vid, og større, end hos nogen anden Art, idet den, især hos de større Exemplarer, strækker sig bagover langt forbi Øjet. Længden af Overkjæven er nemlig lig Hovedets postorbitale Del, saaledes at Snudens Længde er ikke ubetydeligt mindre, end Afstanden fra Øjet til Mundvinkelen.

Tænder ere tilstede i Kjæverne og paa Vomer. I Kjæverne danne de flere Rækker, men disse ere af ulige Størrelse, idet i Overkjæven den ydre Rækkes Tænder ere de største, og stærkt indadkrummede, medens der i Underkjæven sidde flere grovere Tænder (der her idethele ere større, end Overkjævens), i den indre Række. Paa Forsiden af Vomer findes et halvcirkelformigt Baand af finere Tænder.

[1] Ann. Mag. Nat. Hist. Ser. 4, vol. 15, p. 82 (1874); "Norges Fiske", Tillægshefte til Forh. Vid. Selsk. Chra. 1874, p. 117, Tab. 2; Forh. Vid. Selsk. Chra. 1878, No. 4, p. 20.

173 mm), has not hitherto been known to occur in other localities than on the coasts of Norway.[1] In 1878, however, I examined a specimen of this species, which, with a provisional name, in Kröyer's handwriting (probably about 1852), is preserved in the Greenland Collection in the Zoological Museum of Copenhagen.

General Description. *Structure of the Body.* — *Onos septentrionalis* is distinguished from all the other species by a comparatively large head, very long jaws, and by a series of rudimentary barbels extending (besides the normal ones) along the upper jaw. I give here the description originally furnished, together with supplementary data derived from the examination of later specimens, and annex a new representation.

The individuals examined, all from the coasts of Norway, are distinguished by the following dimensions and fin-formulæ.

	a. Røst, Aug. 1877.	b. Bodø, Aug. 1874.	c. Florø, July 1873.
Total length	69 mm	100 mm	173 mm
Length of head	16.8 -	24.5 -	42 -
Number of rays in 2 D.	49 -	49 -	52 -
Number of rays in A.	43 -	41 -	43 -
Number of rays in P.	16 -	15 -	16 -

Body comparatively short and compressed; its depth, considerably less than the length of the head, is to total length about as 1 to $5\frac{2}{3}$.

The vent placed nearly midway between the extremity of the lower jaw and the termination of the anal fin. Peduncle of tail about equal to the width of the interorbital space.

Head large, depressed, and with thick, muscular cheeks; its length is contained rather more than 4 times in the total length. Lower jaw shorter than upper.

The gape remarkably wide, more so indeed than in any other species, extending as it does, especially in large examples, far behind the eye. The upper jaw nearly as long as the postorbital part of the head, and the snout measuring accordingly a good deal less than the distance from the eye to the angle of the mouth.

Teeth in the jaws and on the vomer. In the jaws, arranged in several rows, which, however, are of unequal length on the upper jaw, the teeth in the exterior series being the largest and curving considerably inwards; the lower jaw has several stouter teeth (the teeth in this jaw being generally larger than those in the upper) in the interior row. On the fore part of the vomer extends a semicircular patch of smaller teeth.

[1] Ann. Mag. Nat. Hist. Ser. 4, vol. 15, p. 82 (1874); "Norges Fiske," Appendix to Forh. Vid. Selsk. Chra. 1874, p. 117, Pl. 2; Forh. Vid. Selsk. Chra. 1878, No. 4, p. 20.

Øjnene ere forholdsvis smaa, og, paa Grund af Hovedets fladtrykte Form, temmelig stærkt opadvendte; de indeholdes hos større Individer 2 Gange i Snudens Længde, og omtrent $7^1/_2$ Gange i Høvedlængden. Hos de yngre ere Øjnene forholdsvis større; hos Nordhavs-Expeditionens Individ, der har en Totallængde af blot 69mm, er Øjets Længdediameter ikke langt fra lig Snudelængden, og indeholdes blot 5 Gange i Hovedets Længde. Interorbitalrummet er forholdsvis bredt, og indeholdes $1^1/_2$ Gang i Øjets Højdediameter.

Skjægtraadene ovenfil ere 2 lange, og en hel Række kortere langs Overlæben. De første sidde, som sædvanligt, ved den bagre Rand af det forreste Par Næsebor. De sidste ere 8 i Antal, hvoraf de yderste ere ganske rudimentære; det mellemste Par ere de længste, uden dog at opnaa en Længde af en Øjendiameter. Paa Hagen findes en enkelt, lang Traad.

Gjællespalten er særdeles vid; Gjællehindens Straaler ere 7 i Antal.

Finnerne. 1ste Dorsal er kort; dens Grundlinie er omtrent lig Afstanden fra Snudespidsen til Øjets bagre Rand; dens første forlængede Straale har samme Længde, som Finnens halve Grundlinie, eller 2 Gange Øjets Diameter. Den begynder ubetydeligt foran Pectoralernes Rod, og ender ret over Begyndelsen af samme Finners ydre Trediedel.

2den Dorsal, der tæller 49—52 Straaler, udspringer lige bag 1ste i en Afstand fra Snudespidsen, der er ubetydeligt længere, end Afstanden fra Anus til Kjævernes bagre Kant. Den er næsten jevnhøj overalt, og slutter i omtrent en Øjendiameters Afstand fra Caudalens Rod. Dens største Højde er omtrent lig Grundlinien af 1ste Dorsal.

Analen, der tæller 41—43 Straaler, udspringer umiddelbart bag Anus, og ophører, som hos de fleste Arter, ubetydeligt før sidste Straale af 2den Dorsal. Dens Højde er næsten lig 2den Dorsals Højde.

Pectoralerne, der have 15—16 Straaler, ere brede, korte og afrundede, idet deres Længde neppe er større, end Underkjævens.

Ventralerne tælle 7 (ikke 8) Straaler, og have den 2den Straale noget forlænget, længst hos de yngre Individer, hvor den naar forbi Pectoralernes Spidse; hos de ældre er Spidsen fjernet næsten en Finnelængde fra Anus, og naar ikke Pectoralernes Spidse. Den første og sidste Straale ere enkelte, hvorimod de øvrige ere kløvede til Grunden.

Caudalen tæller 28—30 Straaler, og er noget afrundet, skjønt Hjørnerne ere tydeligt fremtrædende.

Skjælbeklædning. Skjællene ere smaa og fastsiddende, samt beklæde hele Legemet lige ud paa Snuden, saavelsom Grunden af Finnerne; mindst skjælbeklædte ere Ventralerne. Hos Nordhavs-Expeditionens Individ, hvis Totallængde blot er 69mm, er Snuden og Hovedets Sider endnu nøgne, ligesom Skjælbeklædningen endnu ikke er fremkommet paa

Eyes rather small, and directed, from the depressed form of the head, considerably upwards; the diameter, in comparatively large individuals, is to the length of the snout as 1 to 2, and to the length of the head about as 1 to $7^1/_2$. In young individuals, the eyes are relatively larger; in the specimen taken on the Expedition, total length not more than 69mm, the longitudinal diameter of the eye very nearly equals the length of the snout, and is to the length of the head as 1 to 5 only. Interorbital space comparatively wide, being to the vertical diameter of the eye as 1 to $1^1/_2$.

Of the cirri on the upper jaw 2 are long, and a whole series of shorter (partly rudimentary) barbels extends along the upper lip; the former placed as usual at the posterior margin of the foremost pair of nostrils; the latter are 8 in number, the outermost quite rudimentary, the medial pair longest, their length, however, not equalling the diameter of the eye. One long barbule on the chin.

Branchial opening exceedingly wide; branchiostegous rays 7.

Fins. — First dorsal short; length about equalling the distance from the point of the snout to the posterior margin of the eye; the first elongated ray equal in length to half the fin, or to twice the diameter of the eye. It commences a little in advance of the pectorals, terminating immediately above the exterior third of that fin.

Second dorsal, furnished with from 49 to 52 rays, commencing immediately posterior to the first, at a distance from the point of the snout slightly exceeding the distance from the vent to the posterior edge of the jaws. Depth nearly uniform throughout. The fin terminates at a distance about equal to the diameter of the eye from the base of the caudal. Greatest depth about equal to length of basal line of first dorsal.

The anal, furnished with from 41 to 43 rays, commences immediately posterior to the vent, terminating, as in most of the species, a little before the last ray of the 2nd dorsal. Depth nearly equal to that of 2nd dorsal.

The pectorals, which have from 15 to 16 rays, are broad, short, and rounded; length hardly exceeding that of lower jaw.

The ventrals, furnished with 7 (not 8) rays, have the 2nd ray somewhat produced; it is longest in young individuals, the point reaching beyond the extremity of the pectorals. In comparatively old individuals, the extremity is distant almost the length of the fin from the vent, and does not reach the extremity of the pectorals. The first and last rays are simple, the rest cleft to the base.

The caudal, furnished with from 28 to 30 rays, slightly convex, the angles however distinctly perceptible.

Scales. — Scales small, and firmly attached to the skin; extending over the whole surface of the body out upon the snout, and also along the base of the fins; ventrals furnished with fewest scales. In the specimen taken on the Expedition, total length not more than 69mm, the snout and the sides of the head are as yet naked, and the

Finnerne; hos et noget ældre Individ, med en Totallængde af 100mm, ere Skjællene blevne synlige paa Grunden af Caudalen, medens de øvrige Finner endnu ere nøgne.

Sidelinje. Sidelinien er ikke overalt tydelig, især paa Legemets mellemste og bagre Del; den bestaar af en Række af omtrent 20 Porer, der med forholdsvis lange Mellemrum strække sig fra Gjællespaltens øvre Rand hen under 1ste Dorsal, men bøje ved de første Straaler af 2den Dorsal (7de Pore) ned mod Legemets Midtlinie, som de nu følge ud mod Caudalen.

Farve. Denne er mørkt graabrun uden Pletter, blot ubetydeligt lysere paa Undersiden; Iris er blaasort, Mundhulen hvid. Yngre Individer have forholdsvis lysere Farver oventil.

Udbredelse. *O. septemtrionalis* er en nordisk, maaske arctisk Art, hvoraf 3 Individer, (med en Totallængde af 69 til 173mm) hidtil foreligge fra Norges Kyster, foruden 1 fra Grønland. De norske Individer ere alle optagne fra det noget grundere Vand (20—50 Favne); det mindste af dem var det, der erholdtes under Nordhavs-Expeditionen ved Røst, den yderste af Lofotøerne (66½° N. B.). Den sydligste Localitet, Florø udenfor Søndfjord, ligger under 61½° N. B.

Det grønlandske Individ, der opbevares i Universitets-Musæet i Kjøbenhavn, har en Totall. af omtr. 170mm. Det er sandsynligvis allerede i Aarene omkring 1840 indsendt til det nævnte Musæum fra Grønland; en nøjere Angivelse af Localiteten findes ikke.

scales have not begun to develop on the fins; in another individual, total length 100mm, the scales are perceptible along the base of the caudal, the other fins being still naked.

Lateral Line. — Lateral line not everywhere distinct; more especially, however, on the medial and posterior parts of the body. It is composed of a series of about 20 pores, and extends, with comparatively wide interstices, from the upper margin of the branchial aperture beneath the base of the first dorsal, but strikes off obliquely at the first rays of the second dorsal (7th pore) to the mesial line, passing from thence straight along it to the caudal.

Colour. — A uniform greyish-brown, without spots, somewhat lighter on the under surface; irides bluish-black; cavity of the mouth white. Young individuals comparatively lighter.

Distribution. — *O. septemtrionalis* is a northern, possibly an Arctic species, of which only 3 examples (total length ranging from 69mm to 173mm) have as yet been obtained from the Norwegian coast, and 1 from Greenland. The Norwegian specimens were all taken in comparatively shallow water (20—50 fathoms), the smallest being that obtained on the North Atlantic Expedition, off Lofoten, in lat. 66½° N.; the most southerly locality, Florø, on the coast of Søndfjord, is in lat. 61½° N.

The Greenland specimen, preserved in the University Museum, Copenhagen, has a total length of about 170mm; it was probably sent to the Museum from Greenland, certainly not later than 1840; the exact locality is not given.

Fam. Pleuronectidae.

Gen. Platysomatichthys, Bleek.

Versl. Med. Kon. Akad. Wet. Amsterd. D. 13, p. 426 (1862).

Højrevendt. Tænderne stærke, omtrent lige udviklede paa begge Sider; i Overkjæven danne de 2, i Underkjæven 1 Række. Vomerin- og Palatintænder mangle. Mundaabningen vid; Overkjæven gaar tilbage til Øjets Bagrand. De nedre Svælgtænder danne en enkelt Række. Analtorn mangler. Sidelinien næsten ret. Caudalen indskaaren. Skjællene smaa og glatte. Blindsiden stærkt musculøs.

Fam. Pleuronectidæ.

Gen. Platysomatichthys, Bleek.

Versl. Med. Kon. Akad. Wet. Amsterd. D. 13, p. 426 (1862).

Body dextral. Teeth strong, nearly equal in development on both sides; in the upper jaw 2 series, in the lower 1; vomerine and palatine teeth wanting. Mouth wide, maxillary reaching back to the posterior margin of the eye. The lower pharyngeal teeth forming a single row. Preanal spine absent. Lateral line nearly straight. Caudal fin emarginate. Scales small and smooth. The blind side very muscular.

28. Platysomatichthys hippoglossoides, (Walb.) 1792.

Pleuronectes cynoglossus, Fabr. (nec Lin.) Fauna Groenl. No. 118, p. 163 (1780).
Pleuronectes hippoglossoides, Walb. Art. Gen. Pisc. Pars III, p. 115 (1792).
Pleuronectes pinguis, Fabr. Kgl. D. Vid. Selsk. Nat. Math. Afh. 1 D., p. 43 (1824).
Hippoglossus pinguis, Reinh. Kgl. D. Vid. Selsk. Nat. Math. Afh. 7 D., p. 116 (1838).
Reinhardtius hippoglossoides, Gill, Proc. Acad. Nat. Sci. Philad. 1861, App. p. 50 (1861).
Platysomatichthys pinguis, Bleeker, Versl. Med. Kon. Akad. Wet. Amsterd. D. 13, p. 426 (1862).
Hippoglossus groenlandicus, Günth. Cat. Fish. Brit. Mus. vol. 4, p. 404 (1862).
Platysomatichthys hippoglossoides, Goode & Bean, Bull. Ess. Inst. vol. 11, p. 7 (1879).

Diagn. *Det øvre Øje ligger i Profilranden, og er halvt opadvendt. Dorsal- og Analstraalerne ere alle udelte. Legemets Højde indeholdes 3½, Hovedets Længde 4 Gange i Totallængden. Dorsalens Afstand fra Caudalen er større end Halerodens Højde. Legemet skjælbeklædt indtil mellem Øjnene; Finnerne tæt skjælbeklædte. Interorbitalrummet fladt. Ensfarvet mørkt graa- eller gulbrun; Blindsiden, der er ligesaa muskuløs, som Øjensiden, er kun ubetydeligt lysere end denne.*

D. 92—102; A. 71—75; V. 6; P. 14—15; C. 20.

Localit. fra Nordh. Exped. Havet mellem Hammerfest og Beeren-Eiland.

	Stat. 286.
Beliggenhed.	215 Kil. SV. Beeren-Eiland.
Dybde.	447 Favne (817m).
Temp. paa Bunden.	÷ 0.8° C.
Bunden.	Graagrønt Ler.
Datum.	6te Juli 1878.
Antal Individer.	1 yngre Indiv.

Bemærkninger til Synonymien. Endskjønt denne Art er forholdsvis ikke særdeles nær beslægtet med nogen anden Form, idet den besidder flere udprægede Characterer, der baade ere lette at opfatte og beskrive, har den dog en Række Synonymer at opvise, og dens rette Benævnelse har lige til den sidste Tid ikke været endelig fastsat eller anerkjendt.

Fabricius, der var den første, som i sin „Fauna Groenlandica" (1780) beskrev Arten, henførte den under Linné's *Pleuronectes cynoglossus*, hvilken Fejl han selv rettede i en Afhandling „Zoologiske Bidrag", der udkom i 1824 (i 1ste Del af Videnskabs-Selskabets Naturv. og Math. Afhandlinger), og hvor han kalder den *Pleuronectes pinguis*. Paa begge Steder er Arten kjendeligt beskreven, men den Afbildning, der ledsagede hans sidstnævnte Afhandling, er fuldstændig fejlagtig.

Denne slette Figur ledede Günther til i sin Cat. Fish. Brit. Mus. vol. 4 (1862) at anse Fabricii *Pl. cyno-*

28. Platysomatichthys hippoglossoides, (Walb.) 1792.

Pleuronectes cynoglossus, Fabr. (nec Lin.) Fauna Groenl. No. 118, p. 163 (1780).
Pleuronectes hippoglossoides, Walb. Art. Gen. Pisc. Pars III, p. 115 (1792).
Pleuronectes pinguis, Fabr. Kgl. D. Vid. Selsk. Nat. Math. Afh. 1 D., p. 43 (1824).
Hippoglossus pinguis, Reinh. Kgl. D. Vid. Selsk. Nat. Math. Afh. 7 D., p. 116 (1838).
Reinhardtius hippoglossoides, Gill, Proc. Ac. Nat. Sci. Philad. 1861, App. p. 50 (1861).
Platysomatichthys pinguis, Bleeker, Versl. Med. Kon. Akad. Wet. Amsterd. D. 13, p. 426 (1862).
Hippoglossus grœnlandicus, Günth. Cat. Fish. Brit. Mus. vol. 4, p. 404 (1862).
Platysomatichthys hippoglossoides, Goode & Bean, Bull. Ess. Inst. vol. 11, p. 7 (1879).

Diagnosis. — *The upper eye on the marginal line, directed half upwards. Dorsal and anal rays simple. The depth of the body is to total length as 1 to 3½, the length of the head as 1 to 4. Distance of dorsal fin from caudal greater than the depth of the tail at base. Scales extending between the eyes; the fins closely scaled. Interorbital space flat. Colour a dark greyish- or yellowish-brown; the blind side, which is almost as muscular as the upper, only a shade lighter.*

D. 92—102; A. 71—75; V. 6; P. 14—15; C. 20.

Locality (North Atl. Exped): — The open sea, between Hammerfest and Beeren Eiland.

	Stat. 286.
Exact Locality.	215 Kil. SW. Beeren Eiland.
Depth.	447 Fathoms (817m).
Temp. at Bottom.	÷ 0.8° C.
Bottom.	Greyish-green Clay.
Date.	6th July 1878.
Numb. of Specim.	1 Indiv. (young).

Remarks on the Synonymy. — This species, albeit in a comparative sense not very closely related to any other form of the genus, distinguished as it is by divers salient characters, easy alike to apprehend and describe, has nevertheless received a number of synonyms, and even now its true designation has not been finally determined or agreed upon.

Fabricius, who was the first to describe the species, in his "Fauna Grœnlandica" (1780), classed it under Linneus's *Pleuronectes cynoglossus*, an error which he corrected himself in a Memoir entitled "Zoologiske Bidrag", published 1824 (in Part I of "Videnskabs-Selskabets Naturv. og Math. Afhandlinger"), giving it the new name of *Pleuron. pinguis*. In both of these papers recognisable descriptions are furnished of the species; but a figure accompanying the last of the papers is a complete failure.

This eminently defective representation induced Günther, when compiling his Cat. Fish. Brit. Mus. vol. 4 (1862),

glossus (hans senere *pinguis*) som identisk med Linné's *Pl. cynoglossus*, en Anskuelse, som gjendreves af Gill allerede i 1864 (Proc. Acad. Nat. Sci. Philad. 1864). Günther havde imidlertid givet Arten, der efterhaanden ogsaa gjennem andre var bleven bekjendt, det nye Navn *Hippoglossus groenlandicus*, hvorhos Fabricii *Pl. hippoglossus* opføres som dens Synonym; dette sidste var imidlertid ucorrect, da *Pl. hippoglossus*, Fabr., utvivlsomt er den rette *Hippogl. vulgaris*.

Navnet *Hippoglossus pinguis* (Fabr.), under hvilket Arten oftest er omtalt, er yngre, end Walbaum's *Pleuronectes hippoglossoides* (1792), der saaledes indeholder det ældste Artsnavn.

Da forhaandenværende Art i flere Henseender adskiller sig fra Slægten *Hippoglossus*, med hvilken den i Regelen er slaaet sammen, har Gill allerede i 1861 henført den under en ny Slægt, *Reinhardtius* (Proc. Acad. Nat. Sci. Philad. 1861, App.), men da denne Slægt her, uden at være characteriseret, blot er nævnt i en Fortegnelse, vil Bleeker's Navn *Platysomatichthys*, opstillet i 1862 for den samme Art (13de Bind af Med. Kon. Akad. Wet. i Amsterdam), blive at anvende.

Bemærkninger til Beskrivelsen. Det under Nordhavs-Expeditionen erholdte Individ var yngre, og havde følgende Maal:

Totallængde	435 mm
Legemets Længde til sidste Halehvirvel	378 -
Legemets Højde	120 -
Halerodens Højde	34 -
Hovedets Længde	104 -
Pectoralens Længde paa Blindsiden	40 -

Tænderne hos dette Individ vare paa Øjensiden oventil 15, hvoraf de inderste vare meget smaa, nedentil 7, alle lange og naalspidse. Paa Blindsiden fandtes oventil 22, nedentil 6, samtlige af samme Bygning, som de tilsvarende paa Øjensiden.

Straaleantallet var: D. 92; A. 71; C. 20; V. 6; P. 14.

Farven paa Blindsiden var kun lidet lysere, end Øjensidens.

Interorbitalrummet var hos dette yngre Individ forholdsvis smalt, sammenlignet med Øjnenes Størrelse; dets Bredde var omtrent, som Øjets Tverdiameter, men mindre, end Længdediameteren.

Udbredelse. *Platysomatichthys hippoglossoides* er en arctisk Art, der tidligst har været kjendt fra Grønland, hvor den allerede er beskreven i 1780 af Fabricius; den synes her at være talrig paa det noget dybere Vand. Mod Syd gaar den i Nordamerica (ifølge Goode & Bean) lige ned til Dybderne udenfor Essex og Massachusetts i New England-Staterne (42° N. Br.).

I de europæiske Farvande har den hidtil blot været omtalt fra Finmarken, hvor enkelte Exemplarer i de senere Aar ere fundne og opbevarede, men neppe søndenfor 70°

to regard Fabricii *Pl. cynoglossus* (subsequently *pinguis*) as identical with Linneus's *Pl. cynoglossus*, an assumption confuted by Gill in 1864 (Proc. Acad. Nat. Sci. Philad. 1864). Günther, however, had given the species (which had meanwhile been also recorded by others) the new name, *Hippoglossus grœnlandicus*, regarding Fabricius's *Pl. hippoglossus* as its synonym; but the latter was erroneous, and *Pl. hippoglossus* Fabr. is unquestionably the true *Hippogl. vulgaris*.

Hippoglossus pinguis, (Fabr.), the name under which this species has been most frequently mentioned, is anticipated by Walbaum's *Pleuronectes hippoglossoides* (1792), the earliest specific designation of the fish.

The species described being in several respects essentially distinct from the genus *Hippoglossus*, to which it has generally been referred, Dr. Gill, so far back as 1861, saw fit to class it as the type of a new genus, *Reinhardtius* (Proc. Acad. Nat. Sci. Philad. 1861, App.); but the name of this genus being merely recorded in a Catalogue, and no characters enumerated, *Platysomatichthys*, established by Bleeker in 1862 for the same type (Med. Kon. Akad. Wet. Amsterdam, D. 13), must be the correct designation.

Descriptive Observations. — The individual obtained on the Expedition was comparatively young, and measured as follows: —

Total length	435 mm
Length of body to last caudal vertebra	378 -
Depth of body	120 -
Depth of tail at base	34 -
Length of head	104 -
Length of pectoral on blind side	40 -

The teeth on the coloured side, above, in this individual 15, the innermost exceedingly small; below 7, all long and acicular; on the blind side the number above was 22, below 6, similar in structure to those corresponding with them on the coloured side.

The fin-ray formula was as follows: — D. 92; A. 71; C. 20; V. 6; P. 14.

The colour of the skin on the blind side but a shade lighter than on the upper.

Interorbital space in this immature example rather narrow compared to the eyes, its width being about equal to the vertical diameter of the orbit, but less than the longitudinal diameter.

Distribution. — *Platysomatichthys hippoglossoides* is an Arctic species, first observed on the coast of Greenland, and described, so far back as 1780, by Fabricius; throughout that region it would appear to be a common fish at some depth. In North America its range southwards (according to Goode & Bean) extends to the depths lying off the shores of Essex and Massachusetts, in New England (in lat. 42° N.).

In the regions of Northern Europe, the species had been previously met with on the coast of Finmark only, where examples have in later years been taken and pre-

N. B. Af en Bemærkning i Leem's bekjendte Værk over Finmarkens Lapper (Kbhvn. 1767), p. 315, synes den allerede i forrige Aarhundrede at have været erholdt og kjendt af Fiskerne i disse Landsdele. Nordhavs-Expeditionens Individ var optaget paa Havet sydvest for Beeren Eiland, paa det betydelige Dyb af omtrent 450 Favne; sandsynligvis vil denne Art vise sig ikke at mangle paa nogen tilsvarende Dybde i de arctiske Trakter mellem Europa og America.

Gen. Hippoglossoides, Gottsche.

Wiegm. Arch. f. Naturg. 1 Jahrg. 2 B., p. 164 (1835).

Højrevendt. Tænderne smaa, tilspidsede, paa begge Sider lige udviklede; og danne i begge Kjæver en enkelt Række; Vomerin- og Palatintænder mangle. De nedre Svælgtænder danne en enkelt Række. Mundaabningen særdeles vid; Overkjæven gaar tilbage til under Øjets Midte. Analtorn tilstede. Sidelinien næsten ret. Caudalen afrundet. Skjællene temmelig store, paa Øjensiden haartandede. Straaleantallet betydeligt.

29. Hippoglossoides platessoides, (Fabr.) 1780.

A. Nearctiske Synonymer.

Pleuronectes platessoides, Fabr. Fauna Groenl. p. 164 (1780).
Citharus platessoides, Reinh. Kgl. D. Vid. Selsk. Nat. Math. Afh. 7 D., p. 116 og 130 (1838).
Platessa dentata, D. H. Storer. (nec Mitch.) Bost. Journ. Nat. Hist. 1838—39, vol. 2, p. 480 (1839); Hist. Fish. Mass. Camb. Bost. p. 197, pl. 30, Fig. 3 (1867), [teste Br. & Goode].
Drepanopsetta platessoides, Gill, Proc. Acad. Nat. Sci. Philad. 1861, App. p. 50 (1861).
Hippoglossoides dentatus, Gill, Proc. Acad. Nat. Sci. Philad. 1861, App. p. 50 (1861); Günth. Cat. Fish. Brit. Mus. vol. 4, p. 406 (1862).
Hippoglossoides platessoides, Gill, Proc. Acad. Nat. Sci. Philad. 1864, p. 217 (1864).
Potamopsetta dentata, Gill, Proc. Acad. Nat. Sci. Philad. 1864, p. 217 (1864).
Hippoglossoides limandoides, Goode & Bean, Am. Journ. Sci. Arts, vol. 17, 1879, p. 39 (1879).

B. Palæarctiske Synonymer.

Pleuronectes linguatula, Müll. (nec Lin.) Zool. Dan. Prodr. p. 45, No. 377 (1776).
Pleuronectes limandoides, Bloch, Naturg. Ausl. Fische, B. 3, p. 24 (1787).
Hippoglossoides limanda, Gottsche, Wiegm. Arch. f. Naturg. 1835, B. 2, p. 168 (1835).

served, though hardly farther south than in lat. 70° N. From an observation in Leem's well-known work on the Lapps of Finmark (Copenhagen 1767), p. 315, it would appear to have been known and captured by fishermen in those localities as early as the last century. The example obtained on the Expedition was taken in the open sea, south-west of Beeren Eiland, at the very considerable depth of 450 fathoms; probably, the species is nowhere wanting at corresponding depths in any of the Arctic tracts stretching between Europe and America.

Gen. Hippoglossoides, Gottsche.

Wiegm. Arch. f. Naturg. 1. Jahrg. 2 B., p. 164 (1835).

Body dextral. Teeth small and pointed; on either side equally developed; one row in each jaw; vomerine and palatine teeth wanting. Lower pharyngeal teeth forming a single row. Mouth exceedingly wide; maxillary reaching back to the middle of the eye. Preanal spine present. Lateral line almost straight. Caudal rounded. Scales rather large, on the coloured side ciliated. Number of finrays considerable.

29. Hippoglossoides platessoides, (Fabr.) 1780.

A. Nearctic Synonyms.

Pleuronectes platessoides, Fabr. Fauna Groenl. p. 164 (1780).
Citharus platessoides, Reinh. Kgl. D. Vid. Selsk. Nat. Math. Afh. 7 D., p. 116 and 130 (1838).
Platessa dentata, D. H. Storer, (nec Mitch.), Bost. Journ. Nat. Hist. 1838—39, vol. 2, p. 480 (1839); Hist. Fish. Mass. Camb. Bost. p. 197, pl. 30, fig. 3 (1867), [teste Br. & Goode].
Drepanopsetta platessoides, Gill, Proc. Acad. Nat. Sci. Philad. 1861, App. p. 50 (1861).
Hippoglossoides dentatus, Gill, Proc. Acad. Nat. Sci. Philad. 1861, App. p. 50 (1861); Günther, Cat. Fish. Brit. Mus. vol. 4, p. 406 (1862).
Hippoglossoides platessoides, Gill, Proc. Acad. Nat. Sci. Philad. 1864, p. 217 (1864).
Potamopsetta dentata, Gill, Proc. Acad. Nat. Sci. Philad. 1864, p. 217 (1864).
Hippoglossoides limandoides, Goode & Bean, Am. Journ. Sci. Arts, vol. 17, 1879, p. 39 (1879).

B. Palæarctic Synonyms.

Pleuronectes linguatula, Müll. (nec Lin.) Zool. Dan. Prodr. p. 45, No. 377 (1776).
Pleuronectes limandoides, Bloch, Naturg. Ausl. Fische, B. 3, p. 24 (1787).
Hippoglossoides limanda, Gottsche, Wiegm. Arch. f. Naturg. 1835, B. 2, p. 168 (1835).

Pleuronectes limandanus, Parn. Edinb. New Philos. Journ. 1835, p. 210 (1835).

Platessa limandoides, Jen. Man. Brit. Vert. Anim. p. 459 (1835).

Hippoglossoides limandoides, Günth. Cat. Fish. Brit. Mus. vol. 4, p. 405 (1862).

Hippoglossoides platessoides, Coll. Forh. Vid. Selsk. Chra. 1878, No. 14, p. 92 (1878).

Diagn. *Legemet glat, dets Højde indeholdes 3¹/₄, hos ældre Individer 2²/₃, Hovedets Længde 4—4¹/₂ Gange i Totallængden. Dorsalens Afstand fra Caudalen er betydeligt mindre, end Halerodens Højde. Hovedet skjælbeklædt lige ud paa Kjæverne; Finnerne ligeledes skjælbeklædte. Interorbitalrummet smalt; Øjnene ligge fortil i samme Plan, og indeholdes 4, hos fuldt udvoxede Individer 4¹/₂ Gange i Hovedets Længde. Underkjæven længst. Rødgraa, ofte med enkelte (4—6) utydelige, større Pletter langs Grunden af Dorsalen og Analen; Blindsiden hvid.*

M. B. 8. D. 76—92 (93—101); A. 64—72 (60—79); P. 10—11 (9—12); V. 6.

Localit. fra Nordh. Exped. Tanafjord i Finmarken; Havet mellem Nordcap og Beeren Eiland, samt Havet søndenfor Spitsbergen.

	Stat. 261.	*Stat.* 323.	*Stat.* 326.
Beliggenhed.	Tanafjord, Finmarken.	180 Kil. SO. Beeren Eiland.	105 Kil. S. Spitsbergen.
Dybde.	127 Favne (232ᵐ).	223 Favne (408ᵐ).	123 Favne (225ᵐ).
Temp. paa Bunden.	+ 2,8° C.	+ 1,5° C.	+ 1,6° C.
Bunden.	Ler og Mudder.	Brungraat Ler.	Mørkt Ler.
Datum.	25de Juni 1878.	30te Juli 1878.	3die Aug. 1878.
Antal Individer.	6 halvvoxne Indiv.	1 Indiv.	15 Unger og yngre Indiv.

Bemærkninger til Synonymien. I 1780 opstillede og beskrev Fabricius i „Fauna Groenlandica" under No. 119 sin *Pleuronectes platessoides*, og i 1789 blev Arten opført under dette Fabricii Navn i Gmelin's 13de Udgave af Linnæi „Systema Naturae" (p. 1234). Endnu engang gjorde Fabricius den til Gjenstand for en temmelig udførlig Beskrivelse, der indførtes i Kgl. D. Vid. Selsk. Nat. Matlf. Afh. 1 Del, p. 40 (1824), ledsaget af en Tegning, der dog var af meget primitiv Natur.

Senere er Arten under denne Benævnelse kun sjeldent, og aldrig med nogen Udførlighed eller efter Autopsi bleven omtalt, og specielt er dens rette Forhold til den europæiske *Pleuronectes limandoides*, opstillet af Bloch i 1787, ikke gjort til Gjenstand for nogen sammenlignende Undersøgelse[1], naar undtages, at Malmgren, der havde 2 spæde Unger af, hvad han antog var denne Art, fra Spits-

[1] Den udførlige Beskrivelse af „*Pleuronectes platessoides*, Fabr." fra Island, som Faber giver i sin „Naturg. Fische Islands", p. 140 (Frankf. 1829), vedrører ikke denne Art, men *Pl. limanda*, Lin.

Pleuronectes limandanus, Parn. Edinb. New Philos. Journ. 1835, p. 210 (1835).

Platessa limandoides, Jen. Man. Brit. Vert. Anim. p. 459 (1835).

Hippoglossoides limandoides, Günth. Cat. Fish. Brit. Mus. vol. 4, p. 405 (1862).

Hippoglossoides platessoides, Coll. Forh. Vid. Selsk. Chra. 1878, No. 14, p. 92 (1878).

Diagnosis. — *Body smooth; depth to total length as 1 to 3¹/₄, in full-grown examples as 1 to 2²/₃; length of head as 1 to 4—4¹/₂. Distance of dorsal from caudal considerably less than the height of the peduncle of the tail. Head scaled, out on the jaws; the fins, too, are covered with scales. Interorbital space narrow; the eyes equal in front; their diameter is to the length of the head as 1 to 4, in full-grown individuals as 1 to 4¹/₂. Lower jaw longer than upper. Colour reddish-grey, frequently with a few (4—6) large, indistinct spots along the base of the dorsal and anal. The blind side white.*

M. B. 8. D. 76—92 (93—101); A. 64—72 (60—79); P. 10—11 (9—12); V. 6.

Locality (North Atl. Exped.): — The Tana Fjord (Finmark); the open sea, between the North Cape and Beeren Eiland; and the ocean tract south of Spitzbergen.

	Stat. 261.	*Stat.* 323.	*Stat.* 326.
Exact Locality.	The Tana Fjord, Finmark.	180 Kil. SE. Beeren Eiland.	105 Kilom. S. of Spitzbergen.
Depth.	127 Fathoms (232ᵐ).	223 Fathoms (408ᵐ).	123 Fathoms (225ᵐ).
Temp. at Bottom.	+ 2.8° C.	+ 1.5° C.	+ 1.6° C.
Bottom.	Clay and Mud.	Brownish-grey Clay.	Dark Clay.
Date.	25th June 1878.	30th July 1878.	3rd Aug. 1878.
Numb. of Specim.	6 Indiv. (half-grown).	1 Indiv.	15 Ind. (half-grown and young).

Remarks on the Synonymy. — In 1780, Fabricius established and described the species *Pleuronectes platessoides* in his "Fauna grœnlandica" (No. 119); and in 1789 it was classed with this name in Gmelin's 13th Edition of Linneus's "Systema naturæ" (p. 1234). Once again Fabricius made *Pl. platessoides* the subject of a rather elaborate description, in Kgl. D. Vid. Selsk. Nat. Math. Afh. Part 1, p. 40 (1824); and on this occasion he furnished a drawing, which is however exceedingly primitive in character.

Under the name of *Pl. platessoides*, the species has since been rarely recorded, and never once described fully or from autopsy; nor has its true relation to the European form of *Pl. limandoides*, described by Bloch in 1787, been made the subject of comparative investigation,[1] saving that Malmgren, who was in possession of 2 very young examples (belonging, in his opinion, to this species), from Spitz-

[1] The "*Pleuronectes platessoides*, Fabr.," from the coast of Iceland, of which Faber gave a detailed description in his "Naturg. Fische Islands," p. 140 (Frankf. 1829), is not this species, but *Pl. limanda*, Lin.

bergen til Undersøgelse i 1864, troede indtil videre at burde opføre den som en fra *Pl. limandoides* distinct Art (Öfv. Kgl. Vet. Akad. Förh. 1864, p. 525), medens Günther (1862) i sin Cat. Fish. Brit. Mus. vol. 4, p. 405 (i Noten) kan sees at have været tilbøjelig til at betragte dem begge som identiske.

De Characterer, hvorved denne østlig-arctiske Art angives at kunne holdes ud fra den europæiske *Pleuronectes limandoides*, ere væsentlig et større Antal Straaler i de verticale Finner, samt en relativt større Legemshøjde. Jeg har allerede i 1878 i den foreløbige Beretning om Nordhavs-Expeditionens Fiske søgt at paavise, at disse Characterer ikke ere af nogen afgjørende Befydning, og fremsat den Formodning, at begge disse Arter vare identiske.

Efterat jeg i det sidstforløbne Aar, ved Dr. Lütken's Velvillie, har havt Lejlighed til at undersøge den Række typiske Exemplarer af Fabricii *Pleuronectes platessoides*, alle fra Grønland, der opbevares i Musæet i Kjøbenhavn, har jeg fundet denne Formodning bekræftet. En directe Sammenligning mellem de nævnte Typ-Exemplarer og Nordhavs-Expeditionens Individer fra Havet søndenfor Spitsbergen udviste, at de vare fuldstændig overensstemmende indbyrdes, ligesom disse spitsbergenske Individer i ingen væsentlig Henseende ere forskjellige fra ligestore Individer fra Christianiafjorden, som nedenfor skal udvikles.

Af Slægten *Hippoglossoides*, opstillet af Gottsche i 1835 for Bloch's *Pleuronectes limandoides*, findes der idethele blot 3 bekjendte Arter, nemlig foruden den nordatlantiske *H. platessoides*, Fabr., tillige 2 Arter fra de nordlige Dele af det stille Hav (*H. jordani*, Lock. 1879, og *H. exilis*, Jord. & Gilb. 1880).

Bemærkninger til Beskrivelsen. De under Expeditionen erholdte Individer havde følgende Maal og Straaleantal:

Stat. 326. (Søndenfor Spitsbergen).

	Totallængde.	Legemets Højde.	Hovedets Længde.	Straaler i Dorsalen.	Straaler i Analen.
a.	90 mm	25 mm	20 mm	89	70
b.	105 -	30 -	23 -	93	75
c.	105 -	30 -	24 -	91	74
d.	110 -	32 -	25 -	90	71
e.	149 -	43 -	33 -	88	71
f.	150 -	47 -	36 -	91	73
g.	172 -	55 -	39 -	84	68
h.	181 -	55 -	42 -	93	73
i.	182 -	56 -	41 -	92	74
k.	185 -	61 -	43 -	89	71
l.	189 -	59 -	43 -	94	73
m.	223 -	74 -	52 -	91	73
n.	225 -	73 -	51 -	101	79
o.	227 -	69 -	54 -	85	69
p.	235 -	75 -	59 -	91	74

bergen, saw fit to regard it preliminarily as distinct from *Pl. limandoides* (Öfv. Kgl. Vet. Akad. Förh. 1864, p. 525); and that Günther (1862), in his Cat. Fish. Brit. Mus. vol. 4, p. 405 (as appears from the note), was inclined to regard them as identical.

The characters which, as a rule, are said to distinguish this East Arctic species from the European *Pleuronectes limandoides*, consist chiefly in the vertical fins having a greater number of rays, and in the depth of the body being relatively greater. In my preliminary Report (1878) on the fishes from the North Atlantic Expedition, I sought to show that these characters were of no essential importance, and ventured to suggest the identity of the two species.

Since then, this view has received additional support, Dr. Lütken having kindly afforded me opportunity of examining, last year, the specimens of Fabricius's typical *Pleuronectes platessoides* (all from Greenland) preserved in the Zoological Museum at Copenhagen. On instituting a direct comparison between these typical specimens and the individuals collected on the North Atlantic Expedition south of Spitzbergen, they were found to exhibit the closest agreement; nor did the Spitzbergen individuals differ materially from examples of equal size taken in the Christiania Fjord, as will afterwards be shown.

In the genus *Hippoglossoides*, established by Gottsche, 1835, for Bloch's *Pleuronectes limandoides*, are comprised of known species only 3, viz: — the North Atlantic species *H. platessoides*, Fabr., and 2 species occurring in the northern tracts of the Pacific (*H. jordani*, Lock. 1879, and *H. exilis*, Jord. & Gilb. 1880).

Descriptive Observations. — Measurements of, and number of fin-rays in, the specimens obtained on the Expedition; —

Station 326 (South of Spitzbergen).

	Total Length.	Depth of Body.	Length of Head.	Rays in Dorsal.	Rays in Anal.
a.	90 mm	25 mm	20 mm	89	70
b.	105 -	30 -	23 -	93	75
c.	105 -	30 -	24 -	91	74
d.	110 -	32 -	25 -	90	71
e.	149 -	43 -	33 -	88	71
f.	150 -	47 -	36 -	91	73
g.	172 -	55 -	39 -	84	68
h.	181 -	55 -	42 -	93	73
i.	182 -	56 -	41 -	92	74
k.	185 -	61 -	43 -	89	71
l.	189 -	59 -	43 -	94	73
m.	223 -	74 -	52 -	91	73
n.	225 -	73 -	51 -	101	79
o.	227 -	69 -	54 -	85	69
p.	235 -	75 -	59 -	91	74

Stat. 323. (Sydost for Beeren Eiland).

	Totallængde.	Legemets Højde.	Hovedets Længde.	Straaler i Dorsalen.	Straaler i Analen.
q.	350 mm	125 mm	87 mm	87	69

Stat. 261. (Tanafjord, Øst-Finmarken).

	Totallængde.	Legemets Højde.	Hovedets Længde.	Straaler i Dorsalen.	Straaler i Analen.
r.	155 mm	45 mm	38 mm	89	71
s.	170 -	49 -	40 -	89	69
t.	211 -	63 -	50 -	97	74
u.	214 -	61 -	48 -	94	73
v.	245 -	71 -	57 -	96	74
x.	254 -	78 -	60 -	91	74

Til Sammenligning vedføjes en Angivelse af Straaleantallet hos en Del Individer af „*H. limandoides*“ fra et Par andre Punkter af den norske Kyst, hvoraf jeg personlig har kunnet undersøge Individer.

	Totall.	Legemets Højde.	Hovedets Længde.	Straaler i Dorsalen.	Straaler i Analen.
Ø. Finmarken	66 mm	19 mm	14 mm	93	75
—	386 -	138 -	91 -	90	69
Tromsø	32 -	?	?	91	70
—	215 -	66 -	44 -	85	66
—	285 -	88 -	65 -	85	69
Christianiafjorden	185 -	57 -	42 -	86	64
—	210 -	66 -	49 -	87	64
—	218 -	64 -	49 -	82	63
—	220 -	69 -	45 -	86	66
—	246 -	79 -	59 -	82	62
—	258 -	75 -	59 -	80	66
—	298 -	94 -	63 -	79	64

Hvad først den almindelige Legemsbygning angaar, udgjør den gjennemsnitlige Højde af Legemet i Forhold til Totallængden hos et Antal omtrent ligestore Individer fra disse forskjellige Localiteter følgende:

Spitsbergen (9 Ind., Totall. 172—235 mm) . . . 3,10
Øst-Finmarken (5 Ind., Totall. 170—254 mm) . . 3,40
Tromsø (2 Ind., Totall. 215—285 mm) . . 3,24
Christianiafjorden (7 Ind., Totall. 185—298 mm) . . . 3,26

Vistnok sees saaledes Individerne fra Spitsbergen at have havt en relativt noget større Legemshøjde, end Individerne fra Øst-Finmarken, men dette er ganske tilfældigt, da Individerne fra disse Localiteter ere absolut identiske; men mellem de nordligste (fra Spitsbergen) og de sydligste (fra Christianiafjorden) er Forskjellen atter ganske ubetydelig, saaledes at sikre Distinctionscharacterer ikke kunne hentes fra dette Forhold.

Det maa her bemærkes, at Legemshøjden er relativt større hos de fuldt udvoxede Individer, end den ovenfor anførte, der gjælder Individerne i et noget yngre Stadium. Hos 4 af de undersøgte Typ-Exemplarer fra Grønland,

Station 323 (South-east of Beeren Eiland).

	Total Length.	Depth of Body.	Length of Head.	Rays in Dorsal.	Rays in Anal.
q.	350 mm	125 mm	87 mm	87	69

Station 261 (The Tana Fjord, East Finmark).

	Total Length.	Depth of Body.	Length of Head.	Rays in Dorsal.	Rays in Anal.
r.	155 mm	45 mm	38 mm	89	71
s.	170 -	49 -	40 -	89	69
t.	211 -	63 -	50 -	97	74
u.	214 -	61 -	48 -	94	73
v.	245 -	71 -	57 -	96	74
x.	254 -	78 -	60 -	91	74

For comparison is annexed a list of fin-formulæ in divers examples of "*H. limandoides*" from other localities on the Norwegian coast which I have had an opportunity of examining.

	Total Length.	Depth of Body.	Length of Head.	Rays in Dorsal.	Rays in Anal.
East Finmark	66 mm	19 mm	14 mm	93	75
—	386 -	138 -	91 -	90	69
Tromsø	32 -	?	?	91	70
—	215 -	66 -	44 -	85	66
—	285 -	88 -	65 -	85	69
Christiania Fjord	185 -	57 -	42 -	86	64
—	210 -	66 -	49 -	87	64
—	218 -	64 -	49 -	82	63
—	220 -	69 -	45 -	86	66
—	246 -	79 -	59 -	82	62
—	258 -	75 -	59 -	80	66
—	298 -	94 -	63 -	79	64

First, as regards the general structure of the body. The proportion borne by the depth to the total length in a number of specimens, about equal in size, from the said localities is as follows: —

Spitzbergen 9 Ind. (Total L. 172—235 mm) as 1 to 3.10.
East Finmark 5 Ind. (Total L. 170—254 mm) as 1 to 3.40.
Tromsø 2 Ind. (Total L. 215—285 mm) as 1 to 3.24.
Christiania Fjord, 7 Ind. (Total L. 185—298 mm) as 1 to 3.26.

The majority of the Spitzbergen individuals were, indeed, distinguished by a depth of body relatively greater than those from East Finmark; this, however, is merely casual, the latter having been in the strictest sense identical with the former; but between the examples from the most northerly locality (Spitzbergen) and those obtained farthest south (the Christiania Fjord), the difference is very inconsiderable, far too slight, indeed to admit of its furnishing distinctive characters.

It may be noticed, that the depth of the body in full-grown individuals is relatively greater than that here given, which refers to examples in a somewhat earlier stage of growth. In 4 of the typical specimens from Greenland,

hvor Totallængden laa mellem 350mm og 451mm, var Legemshøjden gjennemsnitlig 2,73; omtrent samme Forholde udviste Nordhavs-Expeditionens store Individ fra Beeren Eiland, hvis Totallængde var 350mm, nemlig 2,80, og et stort Individ, som jeg erholdt i Juli 1878 i Varangerfjorden i Øst-Finmarken, hvis Totallængde var 386mm, nemlig 2,79.

Derimod vil unegtelig Straaleantallet vise sig at være constant større hos Individerne fra de nordligste Localiteter (Grønland, Spitsbergen), end fra de sydligste (Christianiafjorden), hvad der fremgaar af de nedenfor anførte Straaleantal hos Individer, hvoraf der fra nogen Localitet have foreligget en Række til Undersøgelse, og denne Forskjel bliver endnu større, om man undersøger de forskjellige Angivelser, der foreligge fra endnu sydligere Landsdele, saasom fra Sverige (Sundström[1]), Danmark (Gottsche[2] og Kröyer[3]), samt England (Yarrell[4]), og Skotland (Parnell[5]).

Grønland	(5 Ind.)	D. 93—83; A. 70—68.
Spitsbergen	(15 Ind.)	D. 101—84; A. 79—68.
Øst-Finmarken, Norge . .	(8 Ind.)	D. 97—89; A. 75—69.
Vest-Finmarken, Norge .	(3 Ind.)	D. 91—85; A. 70—66.
Christianiafjord, Norge .	(7 Ind.)	D. 87—79; A. 66—62.
Sverige		D. 87—78; A. 66—64.
Danmark [Gottsche] . .	(6 Ind.)	D. 87—81; A. 65—64.
Danmark [Kröyer] . . .	(9 Ind.)	D. 88—78; A. 68—60.
Storbritannien		D. 85—76; A. 69—64.

Straalernes Middeltal i de ovennævnte Individ-Rækker har jeg fundet at være følgende paa disse forskjellige Localiteter:

Grønland	D. 88; A. 69.
Spitsbergen	D. 90; A. 72.
Øst-Finmarken, Norge	D. 92; A. 72.
Vest-Finmarken, Norge	D. 87; A. 68.
Christianiafjord, Norge	D. 83; A. 64.
Sverige	D. 82; A. 65[6].
Danmark [Gottsche]	D. 84; A. 65.
Danmark [Kröyer]	D. 82; A. 64.
Storbritannien	D. 80; A. 66[6].

Mellem de Finmarken-Spitsbergenske Individer og Individerne fra Christianiafjorden er der saaledes en gjennemsnitlig Forskjel af omtrent 9 Straaler i Dorsalen, og 8 i Analen, og mellem de førstnævnte og Individerne fra Storbritannien for Dorsalens Vedkommende endog 12. Men Middeltallet fra de mellemliggende Stationer udviser tydelige Overgange, og disse ville utvivlsomt blive endnu klarere, naar Individer blive undersøgte fra flere af disse mellemliggende Localiteter (saaledes f. Ex. fra Nordland i Norge).

[1] Fauna öfver Sveriges Ryggradsdjur, p. 255 (1877).
[2] Wiegm. Arch. f. Naturg. 1835, B. 2, p. 168 (1835).
[3] Danmarks Fiske, B. 2, p. 358 (1843—45).
[4] British Fishes, ed. 2, vol. 2, p. 312 (1841).
[5] Mem. Wern. Nat. Hist. Soc., vol. 7, p. 368 (1838).
[6] Da her intet Individ-Antal kan opgives, har Middeltallet maattet uddrages directe af de angivne Ydergrændser.

total length ranging from 350mm to 451mm, I found the proportional depth of the body to average 2.73, within a fraction that of the large individual taken on the Expedition off Beeren Eiland, viz. 350mm (total length): 2.80; and of a large individual which I obtained in the Varanger Fjord, East Finmark, in July 1878, viz. 386mm (total length): 2.79.

On the other hand, the number of fin-rays will be regularly greater in specimens from the most northerly localities (Greenland, Spitzbergen) than from those farthest south (the Christiania Fjord), as is shown by the numbers (given below) for series of individuals from several localities; and this difference becomes still more apparent on annexing the statements made for regions still farther south, for instance Sweden (by Sundström[1]), Denmark (by Gottsche[2], and Kröyer[3]), England (by Yarrell),[4] and Scotland (by Parnell[5]).

Greenland	(5 Ind.)	D. 93—83; A. 70—68.
Spitzbergen	(15 Ind.)	D. 101—84; A. 79—68.
East Finmark, Norway .	(8 Ind.)	D. 97—89; A. 75—69.
West Finmark, Norway .	(3 Ind.)	D. 91—85; A. 70—66.
Christiania Fjord, Norw.	(7 Ind.)	D. 87—79; A. 66—62.
Sweden		D. 87—78; A. 66—64.
Denmark [Gottsche] . .	(6 Ind.)	D. 87—81; A. 65—64.
Denmark [Kröyer] . . .	(9 Ind.)	D. 88—78; A. 68—60.
Great Britain		D. 85—76; A. 69—64.

The mean number of rays in the said series of individuals from these localities I found to be as follows: —

Greenland	D. 88; A. 69.
Spitzbergen	D. 90; A. 72.
East Finmark, Norway	D. 92; A. 72.
West Finmark, Norway	D. 87; A. 68.
Christiania Fjord, Norway	D. 83; A. 64.
Sweden	D. 82; A. 65[6].
Denmark [Gottsche]	D. 84; A. 65.
Denmark [Kröyer]	D. 82; A. 64.
Great Britain	D. 80; A. 66.[6]

Between the Finmark-Spitzbergen individuals and those from the Christiania Fjord, there is, accordingly, in the dorsal an average difference of about 9 rays, in the anal of 8; and between the former individuals and those from Great Britain, of 12, even in the dorsal. But the mean number for the intervening stations exhibits a distinct transition tendency, which will unquestionably be found still more striking when individuals shall have been examined from more of these intermediate localities (Nordland, in Norway, for instance).

[1] Fauna öfver Sveriges Ryggradsdjur, p. 255 (1877).
[2] Wiegm. Arch. f. Naturg. 1835, B. 2, p. 168 (1835).
[3] Danmarks Fiske, B. 2, p. 358 (1843—45).
[4] British Fishes, ed. 2, vol. 2, p. 312 (1841).
[5] Mem. Wern. Nat. Hist. Soc., vol. 7, p. 368 (1838).
[6] There being no enumeration of the individuals, the mean number has to be deduced from the two extremes.

Desuden faldt ikke sjelden de individuelle Variationer hos Individerne fra de nordligste og de sydligste Localiteter sammen, eller de kunne endog krydse hinanden. Saaledes udviste et af Individerne fra Havet mellem Beeren Eiland og Spitsbergen i Dorsalen 84, i Analen 68 Straaler, medens Kröyer hos et af sine Individer fra Danmark talte i Dorsalen 88, i Analen 67 Straaler.

Nogen Artsdistinction mellem de nordlige og sydlige Former, der kunde begrundes ved Straaleantallet i Finnerne, vil derfor neppe kunne forsvares.

I alle andre Forholde ere de arctiske Individer af Arten ikke til at adskille fra de sydligere. Det er dog en Selvfølge, at i Sammenhæng med det forøgede Straaleantal staar en tilsvarende Forøgelse i Antal af Skjælrækker, Porer i Sidelinien, samt af Hvirvler. Men fuldkommen constante Afvigelser lade sig ligesaalidt paavise i disse Forholde, som i Antallet af Straalerne.

Paa samme Maade altsaa, som *Liparis lineatus* (Lepech.) i de arctiske Landsdele optræder med et constant større Antal Straaler i de verticale Finner, end ved Norges og Sveriges Sydkyst, samt i Østersøen, og uden at herpaa kan begrundes en Adskillelse i Arter eller endog i constante Varieteter, er saaledes det samme Tilfældet med *Hippoglossoides platessoides*; og da Arten er beskreven under dette Navn allerede 7 Aar tidligere, end den sydligere, af Bloch opstillede *Pleurpnectes limandoides*, maa dette sidste Navn vige for det ældre.

Som en Særegenhed ved en Del af de under Expeditionen erholdte Individer kan anføres, at Pectoralens Straaler paa Blindsiden havde en ret afskaaren Rand, og vare tillige kortere, end hos de øvrige Individer.

Føde. Blandt de mellem Beeren Eiland og Spitsbergen fra en Dybde af 123 Favne ophentede Individer blev Ventrikelen og dens Indhold undersøgt hos 11 af forskjellig Størrelse. Indholdet befandtes temmelig ensartet, hvad der ogsaa var at vente, da alle vare erholdte i det samme Kast med Trawlnettet.

Foruden *Themisto libellula*, Mandt, der neppe savnedes hos noget af de undersøgte Individer (hos enkelte fandtes næsten udelukkende denne Art, og i stor Mængde), var særdeles hyppig tilstede *Pecten groenlandicus*, Sow., tildels i talrige Exemplarer, og med fuldkommen hele Skaller. Andre Crustaceer, end den ovennævnte Hyperide, fandtes ikke i nogen Mængde; enkelte Exemplarer af en *Anonyx* fandtes hos flere af Individerne, fremdeles flere *Munnopsis typica*, M. Sars, samt enkeltvis *Syrrhoë crenulata*, Goës, en ung *Pasiphaë tarda*, Kr., en *Ampelisca*, samt en *Protomedeia fasciata*, Kr.

Endvidere fandtes af andre bestembare Dyr flere hele Exemplarer af en *Nephthys*, samt Stykker af Rørene af andre Annelider, hvoriblandt kunde kjendes *Chloraema pellucidum*, M. Sars; fremdeles et Par Exemplarer af *Ophiocten sericeum*, Forb., en *Yoldia frigida*, Tor., en Pla-

Moreover, such individual differences in examples from the most northerly and examples from the most southerly localities, are not infrequently found to meet, or congrue, nay even to pass the differential limit. Thus, for instance, one of the specimens taken between Beeren Eiland and Spitzbergen has in the dorsal 84, in the anal 68 rays; and Kröyer counted in one of his Danish specimens 88 rays in the dorsal, and 67 in the anal.

A specific distinction between the northern and southern forms derived from the number of fin-rays, there is, accordingly, but little reason to assume.

In all other respects the Arctic individuals of the species are not to be distinguished from individuals occurring in southern localities. As a matter of course, however, the increased number of fin-rays involves a proportionate augmentation in the number of scales, vertebræ, and pores in the lateral line; but the variation observed in these characters is not more constant than in the number of fin-rays.

As is the case with *Liparis lineatus*, which in the Arctic regions has the vertical fins invariably furnished with a greater number of rays than when occurring on the coasts of Norway and Sweden and in the Baltic (this feature, however, not sufficing to warrant division into species or constant varieties even), so too with *Hippoglossoides platessoides*. And the species having been diagnosticated under this name 7 years before the southern form *Pleuronectes limandoides*, established by Bloch, the latter name must give way to the earlier designation.

As a peculiar feature in some of the individuals taken on the Expedition, may be noticed the straight margin of the pectoral rays on the blind side; these rays were shorter, too, than in the other individuals.

Food. — Of the numerous individuals collected between Beeren Eiland and Spitzbergen, at a depth of 123 fathoms, the stomach and its contents were examined in 11, of different dimensions. The contents exhibited very little disparity, as was indeed to be expected, all of the individuals having been brought up at one haul with the trawl-net.

Exclusive of *Themisto libellula*, Mandt, which can hardly have been wanting in any one of the individuals examined (in some the ventricle was distended almost wholly with this species), *Pecten grœnlandicus*, Sow., frequently occurred; and with the scales entire. The only crustacean observed in considerable numbers, was the above-mentioned Hyperid. In some of the ventricles were found a few specimens of an *Anonyx*, also several examples of *Munnopsis typica*, M. Sars, and isolated examples of *Syrrhoë crenulata*, Goës, a young *Pasiphaë tarda*, Kr., an *Ampelisca*, and a *Protomedeia fasciata*, Kr.

Of other animals occurred in one specimen several perfect examples of a *Nephthys*, also fragments of the tubes of other Annelids, amongst which *Chlorœma pellucidum*, M. Sars, admitted of being determined; moreover, one or two examples of *Ophiocten sericeum*, Forb., a *Yoldia*

mariæ, samt hos de fleste af Individerne en Del Grus og Mudder.

Hos et af Individerne fra Tanafjord fandtes af Dyrelevninger intet uden *Pecten groenlandicus*, Sow., i flere Exemplarer.

Udbredelse. Da Bloch's *Pleuronectes limandoides*, efter hvad ovenfor er udviklet, maa antages blot at udgjøre den sydlige Stamme af Fabricii *Pleuronectes platessoides*, er Arten fundet fra Spitsbergen og Island ned langs Nordvest-Europas Kyster til den britiske Canal, fremdeles ved Nord-Americas Østkyst fra Grønland af ned til New-England Staterne.

Ved de scandinaviske Kyster har den hidtil væsentlig været kjendt fra det noget grundere Vand i Nærheden af Land; sandsynligvis er den dog udbredt paa passende Dybder overalt i de arctiske Have, men har hidtil paa Grund af mangelfulde Apparater ikke været erholdte i nogen betydelig Dybde, eller i nogen Afstand fra Land. At den dog her maa forekomme tildels i Mængde, fremgaar deraf, at den baade erholdtes (paa *Stat.* 323) i omtrent 200 Kilometres Afstand fra nærmeste Land, og ved en enkelt Lejlighed (paa *Stat.* 326) i et samlet Antal af 15 Individer, store og smaa, fra en Dybde af mellem 200 og 300 Favne.

frigida, Tor., a *Plumaria*, and, in most of the individuals, a little gravel or mud.

In one of the Tana Fjord specimens, *Pecten grœnlandicus* — several examples — constituted the sole contents of the ventricle.

Distribution. — From what has been stated above, Bloch's *Pleuronectes limandoides* must be regarded as the southern branch of Fabricius's *Pleuronectes platessoides*; and the species ranges therefore from Spitzbergen and Iceland along the north-western shores of Europe to the British Channel; and in America, from Greenland to the coasts of the New England States.

On the coasts of Scandinavia, *H. platessoides* has heretofore been chiefly taken in comparatively shallow water, a short distance from land; probably, however, its range extends throughout all parts of the Arctic Ocean, though it has not as yet, owing to the defective construction of the apparatus employed for capturing it, been met with at any considerable depth, or in the open sea. But that it does occur, and even abundantly, in such localities, may be inferred from its having been taken at Station 323, nearly 200 kilometrés from the nearest land; nay, on one occasion (Station 326) as many as 15 individuals, large and small, were obtained at a depth of 200—300 fathoms.

Gen. Glyptocephalus, Gottsche.

Wiegm. Arch. f. Naturg. 1 Jahrg. 1835, B. 1, p. 156 (1835).

Legemet højrevendt, glat, særdeles langstrakt, med kort Halerod. Tænderne smaa, tætsiddende, mejseldannede, talrigst paa Blindsiden, og danne i begge Kjæver en enkelt sluttet Række: Vomerin- og Palatintænder mangle. Mundaabningen særdeles liden; Kjæverne omtrent lige lange, og naa hos de udvoxede neppe hen under Øjets forreste Rand. Analtorn i Regelen tilstede. Sidelinien næsten ret. Caudalen afrundet. Skjællene smaa, af ulige Størrelse, glatte. Hovedet lidet, med en Række Gruber paa Blindsiden; Øjnene tætsiddende. Straaleantallet betydeligt.

Gen. Glyptocephalus, Gottsche.

Wiegm. Arch. f. Naturg. 1 Jahrg. 1835, B. 1, p. 156 (1835).

Body dextral, smooth, elongated, peduncle of tail short. Teeth small, closely set, incisorial, most numerous on the blind side, forming a continuous cutting edge on either side: vomerine and palatine teeth wanting. Mouth very small; jaws about equal in length, in adults scarcely reaching the anterior margin of the eye. Preanal spine as a rule present. Lateral line almost straight. Caudal rounded. The scales small, varying in size, smooth. Head small, with a series of foveæ on the blind side. Eyes approximate. Fin-rays numerous.

30. Glyptocephalus cynoglossus, (Lin.) 1766.

Pleuronectes cynoglossus, Lin. Syst. Nat. ed. 12, tom. 1, p. 456 (1766).
Pleuronectes pola, Lacép. Hist. Nat. Poiss. suites à Buffon, tom. 4, p. 401 (1819) [teste Br. & Goode].
Pleuronectes saxicola, Faber, Tidsskr. f. Naturv. 5 B., p. 244 (Kbhvn. 1828); Isis 1828, p. 877 (1828).

30. Glyptocephalus cynoglossus, (Lin.) 1766.

Pleuronectes cynoglossus, Lin. Syst. Nat. ed. 12, tom. 1, p. 456 (1766).
Pleuronectes pola, Lacép. Hist. Nat. Poiss. suites à Buffon, tom. 4, p. 401 (1819) [teste Br. & Goode].
Pleuronectes saxicola, Faber, Tidsskr. f. Naturv. 5 B., p. 244 (Kbhvn. 1828); Isis 1828, p. 877 (1828).

Pleuronectes nigromanus, Nilss. Prodr. Ichth. Scand., p. 56 (1832).
Glyptocephalus saxicola, Gottsche, Wiegm. Arch. f. Naturg. 1835, 1 B., p. 156 (1835).
Platessa pola, Jen. Man. Brit. Vertebr. Anim., p. 458 (1835).
Platessa elongata, Yarr. Suppl. to Brit. Fish., p. ? (1839); Hist. Brit. Fish. ed. 2, vol. 2, p. 318 (1841).
Platessa saxicola, Kr. Danm. Fiske, 2 B., p. 338 (1843—45).
Glyptocephalus cynoglossus, Gill, Proc. Acad. Nat. Sci. Philad. 1873, p. 360 (1873).
Glyptocephalus acadianus, Gill, Proc. Acad. Nat. Sci. Philad. 1873, p. 360 (1873).
Glyptocephalus elongatus, Gill, Proc. Acad. Nat. Sci. Philad. 1873, p. 362 (1873).
Pleuronectes elongatus, Day, Proc. Zool. Soc. Lond. 1879, p. 755, Pl. LXI (1879).

Diagn. *"Legemet glat; dets Højde indeholdes hos yngre Individer 4, hos ældre 3 Gange (eller derunder), Hovedets Længde 5¼ til 5¾ Gange i Totallængden. Tænderne paa Øjensiden 6—13 i Over-, 7—14 i Underkjæven, paa Blindsiden 17—26 i Over-, 19—28 i Underkjæven." Legemet skjælbeklædt indtil Øjnenes Forrand; Finnerne ligeledes mere eller mindre skjælbeklædte. Interorbitalrummet smalt, med ophøjet Kjøl. Øjnene store, indeholdes 3—3½ Gange i Hovedets Længde; det nedre Øje ligger ⅓ Øjenlængde foran det øvre. Analtorn tilstede. Pectoralen paa Blindsiden ikke forlænget. Ensfarvet rødagtig graa; Blindsiden hos de ældre mer eller mindre mørkfarvet. Pectoralen paa Øjensiden i sin ydre Halvdel sort.*

M. B. 7. D. 110 (95—120); A. 95 (87—102); P. 10—11 (9—14); C. 23 (18—26); V. 6.

Localit. fra Nordh. Exped. Lofoten; Tanafjord i Finmarken.

	—	*Stat. 261.*
Beliggenhed.	Røst, Lofoten.	Tanafjord, Finmarken.
Dybde.	150 Favne (276m).	127 Favne (232m).
Temp. paa Bunden.	+ 5,0° C.	+ 2,8° C.
Bunden.	Sandbund.	Mudder og Ler.
Datum.	26de Juni 1877.	25de Juni 1878.
Antal Indiv.	1 halvvoxent Indiv.	1 Indiv.

Bemærkninger til Synonymien. *Glyptocephalus cynoglossus* er, som det synes, Slægtens eneste Repræsentant i de atlantiske Have, efterat *Gl. acadianus*, Gill, fra Nord-Americas Østkyst har vist sig ikke at være artsforskjellig fra *Gl. cynoglossus*. Først i det stille Hav (California) optræde 2 andre, i afvigte Aar (1880) af Lockington beskrevne Arter.

Det yngste af Nordhavs-Expeditionens Individer, hvis Totallængde var 212mm (8½ eng. Tomme), tilhører øjensynlig det Stadium af Arten, hvori den af engelske Naturforskere er opstillet som en egen Art under Navn af *Pleuronectes elongatus* (Yarr.). Efterat denne Form, hvoraf blot enkelte Individer hidtil have været omtalte, alle fra de

Pleuronectes nigromanus, Nilss. Prodr. Ichth. Scand., p. 57 (1832).
Glyptocephalus saxicola, Gottsche, Wiegm. Arch. f. Naturg. 1835, 1 B., p. 156 (1835).
Platessa pola, Jen. Man. Brit. Vertebr. Anim., p. 458 (1835).
Platessa elongata, Yarr. Suppl. to Brit. Fish., p. ? (1839); Hist. Brit. Fish. ed. 2, vol. 2, p. 318 (1841).
Platessa saxicola, Kr. Danm. Fiske, 2 B., p. 338 (1843—45).
Glyptocephalus cynoglossus, Gill, Proc. Acad. Nat. Sci. Philad. 1873, p. 360 (1873).
Glyptocephalus acadianus, Gill, Proc. Acad. Nat. Sci. Philad. 1873, p. 360 (1873).
Glyptocephalus elongatus, Gill, Proc. Acad. Nat. Sci. Philad. 1873, p. 362 (1873).
Pleuronectes elongatus, Day, Proc. Zool. Soc. Lond. 1879, p. 755, Pl. LXI (1879).

Diagnosis. — *Body smooth; its depth, in young individuals is to total length as 1 to 4, in adults as 1 to 3 (or less); length of head as 1 to 5¼—5¾. Teeth on coloured side in the upper jaw 6—13, in the lower 7—14; on the blind side in the upper jaw 17—26, in the lower 19—28. Body scaled to the anterior margin of the eyes; the fins likewise more or less covered with scales. Interorbital space narrow, with a sharp ridge; the eyes large, their diameter being to the length of the head as 1 to 3—3½; the lower eye about one-third of its diameter in advance of the upper. Preanal spine present. The pectoral on the blind side not produced. Colour rufous brown; the blind side in adults more or less tinged with the same colour. Outer half of pectoral on the coloured side black.*

M. B. 7. D. 110 (95—120); A. 95 (87—102); P. 10—11 (9—14); C. 23 (18—26); V. 6.

Locality (North Atl. Exped.): — Lofoten; the Tana Fjord (Finmark).

	—	*Stat. 261.*
Exact Locality.	Røst, Lofoten.	The Tana Fjord, Finmark.
Depth.	150 Fathoms (276m).	127 Fathoms (232m).
Temp. at Bottom.	+ 5.0° C.	+ 2.8° C.
Bottom.	Sand.	Mud and Clay.
Date.	26th June 1877.	25th June 1878.
Numb. of Specim.	1 Indiv. (half-grown).	1 Indiv.

Remarks on the Synonymy. — *Glyptocephalus cynoglossus* is apparently the only species of the genus inhabiting the Atlantic Ocean, *Gl. acadianus*, Gill, from the east coast of North America, having been shown to be specifically distinct from *Gl. cynoglossus*. Two other species (described by Lockington in the current year [1880]) occur, however, in the Pacific (coast of California).

The youngest of the specimens taken on the Expedition, total length 212mm (8½ English inches), obviously represents the stage of development in which *Gl. cynoglossus* has been referred by English naturalists to a separate species, under the name of *Pleuronectes elongatus* (Yarr.). This form, of which up to the present time a few specimens

engelske Kyster, i Regelen har været anseet som identisk med *Gl. cynoglossus*, har Dr. Day i forrige Aar paany hævdet dens Artsberettigelse, efterat et nyt Individ var kommet ham i Hænde i 1879, ligeledes fra de engelske Kyster (Cornwall). I Proc. Zool. Soc. London 1879, p. 755, giver han en ny Beskrivelse og en correct Planche (Pl. LXI) af denne efter hans Mening distincte Art; Individets Længde var 9 eng. Tommer (omtr. 228^{mm}), saaledes noget nær af samme Størrelse, som det mindste af Nordhavs-Expeditionens.

Det fremgaar af Dr. Day's Beskrivelse af *Pleuronectes elongatus*, at den væsentligste Ejendommelighed, sammenlignet med *Glyptocephalus cynoglossus*, ligger i Skjælbeklædningens Udstrækning, idet denne hos den førstnævnte ikke strækker sig ud over Finnestraalerne (undtagen over Caudalen), hvilket derimod er Tilfældet hos den sidste.

Undersøges dette Forhold hos det mindste af Expeditionens Individer, vil det sees, at ogsaa her strækker Skjælbeklædningen sig blot til Grunden af de verticale Finner, og blot langs den nederste Del af enkelte Straaler ville de første Spor af Skjæl vise sig. Det ældste Exemplar, hvis Totall. er 401^{mm}, har derimod Skjælbeklædning ud over Finnerne, dog ingenlunde særdeles rigeligt, men hovedsagelig blot langs Straalerne, og væsentlig paa disses nedre Del; et Par Unger fra Norges Vestkyst, hvis Totallængde dog ikke overstiger 65^{mm}, (de eneste Unger, som jeg har kunnet undersøge), ere endnu ganske skjælløse.

De øvrige Forskjelligheder mellem *Pleuronectes elongatus* og *Glyptocephalus cynoglossus* ere ganske uvæsentlige, og kunne samtlige begrundes ved den førstnævntes yngre Alderstrin[1].

Bemærkninger til Beskrivelsen. Ingen Forskjel kunde opdages mellem Individet fra Finmarken, og ligestore Individer fra Christianiafjorden. De 2 under Expeditionen erholdte Individer havde følgende Maal:

	a. Lofoten.	*b.* Tanafjorden.
Totallængde	212^{mm}	401^{mm}
Længde uden Caudal	170 -	325 -
Hovedets Længde	37 -	69 -
Legemets Højde	52 -	141 -

Tændernes Antal var hos det største Individ paa Øjensiden oventil 10, nedentil 10, paa Blindsiden oventil 21, nedentil 19; hos det mindste paa Øjensiden oventil 10, nedentil 11, paa Blindsiden oventil 21, nedentil 23.

Straaleantallet var:

a. D. 113; A. 97; P. 11; C. 23; V. 6.
b. D. 109; A. 90; P. 10; C. 26; V. 6.

Udbredelse. Arten er udbredt fra Canalen op langs Europas Nordvestkyst, men var hidtil ikke funden længere

[1] „B. V." er sandsynligvis en Trykfejl for B. VII (hvis B. skal være samme Tegn, som i Almindelighed udtrykkes som M.B.).

only have been taken — all from the English coasts — has been generally regarded as identical with *Gl. cynoglossus*; but in 1879 its supposed claim to specific distinction was again asserted, by Dr. Day, who in that year had obtained a new specimen, and this one too from the English coast (Cornwall). In Proc. Zool. Soc. London, 1879, p. 755, that naturalist furnished a new description, with a good drawing (Pl. LXI), of this, in his opinion, distinct species. The total length being 9 English inches (about 228^{mm}), it is of very nearly the same dimensions as the smallest of the specimens collected on the Expedition.

The chief distinctive feature in *Pleuronectes elongatus*, as compared with *Glyptocephalus cynoglossus*, is derived, according to Dr. Day, from the scaled integument, which in the former does not extend over the fin-rays (saving those of the caudal); in the latter, however, it does.

But, on examining the smallest of the specimens obtained on the Expedition, the scaled integument is found to reach to the base of the vertical fins, a few rays only exhibiting on their lower part traces of scales. In the oldest example, total length 401^{mm}, the scaling extends out on the fins; it is not dense however, the scales occurring chiefly along the rays, and in particular on their lower part. Two very young specimens (from the west coast of Norway), with a total length of not more than 65^{mm}, the only young examples I have had an opportunity of examining, were still entirely scaleless.

The other distinctive peculiarities supposed to distinguish *Pl. elongatus* from *Gl. cynoglossus*, are none of them specific characters, but may all be referred to the immaturity of the former.[1]

Descriptive Observations. — No difference could be detected between the individual from Finmark and examples of equal size taken in the Christiania Fjord. The specimens obtained on the Expedition, measured as follows: —

	a. Lofoten.	*b.* Tana Fjord.
Total Length	212^{mm}	401^{mm}
Length exclusive of Caudal	170 -	325 -
Length of Head	37 -	69 -
Depth of Body	52 -	141 -

Number of teeth on the coloured side in the largest individual 10 above and 10 below, on the blind side, 21 above and 19 below; in the smallest individual on the coloured side 10 above and 11 below, on the blind side 21 above and 23 below.

The fin-rays were as follows: —

a. D. 113; A. 97; P. 11; C. 23; V. 6.
b. D. 109; A. 90; P. 10; C. 26; V. 6.

Distribution. — The range of *G. cynoglossus*, which extends from the British Channel along the north-western

[1] "B. V" is probably a misprint for B. VII, assuming the signification of B. to be that usually attached to M.B.

mod Nord, end til Trondhjemsfjorden i Norge. Ved de engelske Kyster er den ikke sjelden, men den forekommer idethele sparsommere længere mod Nord; i Kattegat er den intetsteds talrig, og den gaar, saavidt bekjendt, ikke ind i Østersøen.

I Norge er den funden paa adskillige Localiteter, talrigst i Christianiafjorden, hvor den saagodtsom daglig i Høstmaanederne sees paa Fisketorvene; undertiden kunne 20—50 Individer erholdes i det samme Dræt. Ved Landets Vestkyst er den idethele sparsom; først i 1875 blev den med Sikkerhed fundet ved Bergen, ligesom et Par Individer ere erholdte ved Florø og ved Christiansund. Nordhavs-Expeditionens Individer vare, som ovenfor nævnt, fra Lofoten og Finmarken, og vare optagne fra en Dybde af indtil 150 Favne; disse ere de nordligste Punkter, fra hvilke Arten hidtil vides erholdt (71° N. B.), ligesom den hidtil ikke, saavidt vides, er observeret paa større Dybde, end den ovenfor anførte.

Ved de egentlig arctiske Ølande er den endnu ikke paavist; derimod forekommer den atter paa Østkysten af Nord-America, hvor den i 1872 fandtes første Gang, og senere (i 1877) optoges i stort Antal udenfor Kysterne af New England-Staterne, af U. S. Fish-Commission, paa en Dybde af indtil 90 Favne. Den hører saaledes blandt denne Families Dybvandsformer.

Fam. Ophidiidae.

Gen. Rhodichthys, Coll. 1878 (n. gen.).

Forh. Vid. Selsk. Chra. 1878, No. 14, p. 99 (1878).

Legemet forholdsvis højt, uden Skjæl eller Sidelinie, halvt gjennemsigtigt, bag Bughulen stærkt sammentrykt. Hovedet bredt og tykt; Caudalen distinct, blot ved Roden tilvoxet Analen og Dorsalen. Anus foran Pectoralerne, lige under Gjællespalten. Ventralerne bestaa af 2 lange Filamenter, fastvoxede til Tungebenet, og kløvede i sin ydre Halvdel. Analen begynder langt bagenfor Anus; Dorsalen enkelt. Tænder tilstede paa Mellemkjæverne og i Underkjæven. Gjællelaagene uvæbnede.

shores of Europe, but the species had not previously been observed farther north than the Drontheim Fjord. On the English coast it is anything but a rare fish; in the Cattegat it nowhere occurs abundantly, and it does not enter the Baltic.

In Norway, it is met with in several localities, more particularly the Christiania Fjord; and may almost dayly during the autumn months be seen exposed for sale in the fish-markets; from 20 to 50 individuals are sometimes brought up at a single haul. Off the western shores of this country the species is on the whole but rarely met with; indeed its occurrence off Bergen was not ascertained with certainty till 1875; one or two individuals have likewise been obtained near Florö and Christiansund. The specimens brought home by the North Atlantic Expedition — taken at a depth of 150 fathoms — were, as previously observed, from Lofoten and Finmark; the most northerly localities and the greatest depths in which the species is as yet known to have been met with (71° N.).

On the islands in the Polar Sea the species has not been shown to occur; it inhabits however the eastern shores of North America, where it was first observed in 1872, and subsequently (1877) captured, in large numbers, off the coast of the New England States, by the U. S. Fish-Commission, at depths reaching 90 fathoms. Hence it must be classed among the deep-sea forms of this family.

Fam. Ophidiidæ.

Gen. Rhodichthys, Coll. 1878 (n. gen.).

Forh. Vid. Selsk. Chra. 1878, No. 14, p. 99 (1878).

Body comparatively deep, without scales or lateral line, semi-translucent, posterior to the abdominal cavity much compressed. Head broad and thick; caudal fin distinct, at the base only connate with the anal and dorsal. The vent placed anterior to the pectorals, immediately beneath the branchial opening. The ventrals consisting of two long filaments attached to the hyoid bone, the exterior half bifid. The anal originating a considerable distance posterior to the vent. The dorsal single. Teeth on the intermaxillary and the lower jaw. Opercles unarmed.

31. **Rhodichthys regina**, Coll. 1878 (n. sp.).

Pl. V, Fig. 37—39.

Rhodichthys regina, Coll. Forh. Vid. Selsk. Chra. 1878, No. 14, p. 99 (1878).

Diagn. *Ensfarvet rød overalt. Hovedet indeholdes næsten 4 Gange, Legemets største Højde $4^4/_5$ Gange i Totallængden. Legemet fortil højt, bagtil stærkt afsmalnende, med lang og smal Halerod. Overkjæven længere, end Underkjæven. Dorsalen begynder umiddelbart over Gjællespalten; Caudalen rager med de ydre 3 Femtedele ud over Dorsalen og Analen. Øjnene smaa, indeholdes 7 Gange i Hovedets Længde; Interorbitalrummet bredt. Tænderne yderst fine, stillede i flere Rækker. Næseborene dobbelte. Appendices pyloricae 10. Størrelsen af det eneste undersøgte Individ, en Han, 297mm.*

M. B. 6. D. 60; A. 57; C. 10; P. 11—12.

Localit. fra Nordh. Exped. Havet midt mellem Beeren Eiland, Jan Mayen og Finmarken.

	Stat. 297.
Beliggenhed.	465 Kil. NØ. Jan. Mayen.
Dybde.	1280 Favne (2341 m).
Temp. paa Bunden.	— 1,4° C.
Bunden.	Biloculina-Ler.
Datum.	16de Juli 1878.
Antal Indiv.	1 Indiv.

Alm. Bemærkninger. *Rhodichthys regina* er ikke nær beslægtet med nogen hidtil fundet nordeuropæisk Fiskeslægt. Hele Legemet er fuldstændig glat, uden Spor af Skjæl eller Sidelinie, og havde en intens rød Farve. Huden er særdeles tynd, og halvt gjennemsigtig; oprindelig var den tilvoxet Legemet, men efterat Individet har været opbevaret paa Spiritus, har den overalt løsnet sig, og lader sig med Lethed forskyde med Fingeren. Individet, der endnu levede, da det bragtes op fra den store Dybde af 1230 Favne, holdtes en Tid levende, men viste sig herunder dorsk og lidet bevægeligt. Hele Legemet var af særdeles blød, eller næsten gelatinøs Consistens; det var oprindelig halvt gjennemsigtigt, saa at flere af de indre Organer kunde sees, saaledes Hvirvelsøjlen, Hjernens forskjellige Afdelinger, Høreapparatet, Gjællerne, og de fleste af Indvoldene; endnu efterat Individet i længere Tid har været opbevaret paa Spiritus, har denne Gjennemsigtighed tildels vedligeholdt sig.

Udmaalinger.

Totallængde	297mm
Legemets Længde til sidste Halehvirvel	267 -
Legemets Højde ved Begyndelsen af Dorsalen	63 -
Legemets Højde ved Begyndelsen af Analen	59 -
Hovedets Længde	77 -
Hovedets Højde lige bag Ventralerne	60 -
Hovedets Tykkelse over Kinderne	46 -

31. **Rhodichthys regina**, Coll. 1878 (n. sp.).

Pl. V, fig. 37—39.

Rhodichthys regina, Coll. Forh. Vid. Selsk. Chra. 1878, No. 14, p. 99 (1878).

Diagnosis. — *Colour a uniform bright red. The length of the head is to the total length nearly as 1 to 4, the extreme depth of the body as 1 to $4^4/_5$. Anterior part of body deep, in the posterior region rapidly tapering; tail at base long and slender. Upper jaw longer than lower. The dorsal fin originating immediately above the branchial aperture; the caudal projecting to the extent of three-fifths of its length beyond the dorsal and anal. Eyes small, their diameter being to the length of the head as 1 to 7; interorbital space wide. The teeth exceedingly minute, arranged in several series. Nostrils double. Pyloric appendages 10. Length of the only individual obtained (a male) 297mm.*

M. B. 6. D. 60; A. 57; C. 10; P. 11—12.

Locality (North Atl. Exped.): — The open sea, between Beeren Eiland, Jan Mayen, and Finmark.

	Stat. 297.
Exact Locality.	465 Kil. NE. Jan Mayen.
Depth.	1280 Fathoms (2341 m).
Temp. at Bottom.	— 1.4° C.
Bottom.	Biloculina Clay.
Date.	16th July 1878.
Numb. of Specim.	1 Indiv.

General Remarks. — *Rhodichthys regina* is not nearly related to any known genus of North European fishes. The body perfectly smooth, with no trace of scales or lateral line; colour a bright red. The skin exceedingly thin, and quite transparent; originally it was firmly attached to the body; but it has now, the individual having been preserved some time in spirits, become loose over the whole surface, and may be readily displaced with the fingers. The individual came up alive, from the great depth of 1230 fathoms, and survived some time in a tub of sea-water; but its movements were sluggish. The whole of the body exceedingly soft; originally, it was semi-translucent, so that divers of the internal organs could be distinctly seen, for instance the gills, the vertebral column, the various divisions of the brain, the auditory apparatus and the greater part of the intestines. Even in the present state of preservation, this transparency is still obvious.

Measurements.

Total length	297mm
Length of body to last caudal vertebra	267 -
Depth of body at the origin of the dorsal	63 -
Depth of body at the origin of the anal	59 -
Length of head	77 -
Depth of head immediately posterior to the ventrals	60 -
Thickness of head across the cheeks	46 -

Snudens Længde	25 mm
Øjets Diameter (Iris)	11 -
Hovedets postorbitale Del	42 -
Lindsens Diameter	6 -
Afstanden mellem Øjnene (Interorbitalrummet)	30 -
Gjællespaltens Højde	46 -
Overkjævens Længde	39 -
Snudespidsens Afstand fra Ventralerne	52 -
Underkjævespidsens Afstand fra Ventralerne	42 -
Snudespidsens Afstand fra Anus	62 -
Underkjævespidsens Afstand fra Anus	52 -
Snudespidsens Afstand fra Beg. af Dorsalen	79 -
Snudespidsens Afstand fra Beg. af Analen	98 -
Anus's Afstand fra Analen	36 -
Dorsalens største Højde	19 -
Længden af sidste Dorsalstraale	10 -
Ventralens Længde	97 -
Pectoralens Grundlinie	16 -
Pectoralens Længde	43 -
Caudalens Længde	30 -
Analens største Højde	18 -
Længden af sidste Analstraale	11,5 -
Halerodens Højde	4 -
Fra Anus til Halespidsen (Halepartiets Længde)	235 -

Beskrivelse. *Legemsbygning.* Legemet er bagenfor Hovedet højt indtil Analens Begyndelse; herfra aftager hurtigt Højden, og Legemet løber i sin sidste Del ud i en lang og jevn Spidse, der yderst er særdeles lav (kun lidt over Halvdelen af en Lindsediameter). Imidlertid ere de verticale Finner næsten overalt temmelig høje, saaledes at Individet ser forholdsvis højt ud i den største Del af sin Længde. Bagenfor Nakken og den umiddelbart under Nakken liggende Bughule er Legemet overordentlig stærkt sammentrykt.

Anus er særdeles langt fremrykket, og ligger lige under Gjællespalten, saaledes i en Afstand fra Snudespidsen, der indeholdes ikke langt fra 5 Gange i Totallængden. Det ligger foran Pectoralerne, og i en betydelig Afstand fra Analens Begyndelse; ved dets bagre Rand findes en kort, tyk og stiv Papille.

Af Totallængden udgjør:

Hovedets Længde	3,85
Snudens Afstand fra Anus	4,79
Snudens Afstand fra Dorsalen	3,75
Snudens Afstand fra Analen	3,03
Halens Længde (fra Anus til Halespidsen)	1,21
Legemets Højde (ved Beg. af Dorsalen)	4,71

Hovedet er brødt og tykt; dets Længde indeholdes ikke fuldt 4 Gange i Totallængden (eller, Caudalen fraregnet, ikke fuldt $3^1/_2$ Gange). Dets Bredde over Kinderne er ubetydeligt større, end dets postorbitale Del; Snuden er særdeles bred og stump.

Panden og Nakken ere stærkt hvælvede, med underliggende tykke Muskler; paa Hovedets øvrige Dele ere Knoglerne blot beklædte med en tynd og løs Hud. Den øvre Profilrand er jevnt nedløbende, eller, hvor Huden

Length of snout	25 mm
Diameter of eye (iris)	11 -
Postorbital region of head	42 -
Diameter of the lens	6 -
Distance between the eyes (interorbital space)	30 -
Depth of branchial aperture	46 -
Length of upper jaw	39 -
From point of snout to ventrals	52 -
From extremity of lower jaw to ventrals	42 -
From point of snout to vent	62 -
From extremity of lower jaw to vent	52 -
From point of snout to origin of dorsal	79 -
From point of snout to origin of anal	98 -
Distance of vent from anal	36 -
Extreme depth of dorsal	19 -
Length of last dorsal ray	10 -
Length of ventral	97 -
Depth of pectoral at base	16 -
Length of pectoral	43 -
Length of caudal	30 -
Extreme depth of anal	18 -
Length of last anal ray	11,5 -
Depth of tail at base	4 -
From the vent to the tip of caudal (L. of tail)	235 -

General Description. *Structure of the Body.* — Depth of body considerable, as far as the origin of the anal fin; from thence it rapidly diminishes, the body terminating in a rather narrowish tail, the root very thin and slender, (the depth but slightly exceeding half the diameter of the lens); the vertical fins, however, are comparatively deep, and hence the height of the individual is throughout the greater part of its length considerable. Posterior to the nape and the abdominal cavity, placed immediately beneath, the body is remarkably compressed.

The vent far in front, immediately beneath the branchial aperture, the distance from the point of the snout being to the total length very nearly as 1 to 5. It is placed anterior to the pectorals, and at a considerable distance from the origin of the anal; at the posterior margin occurs a small papillary wart, thick and hard.

The Total Length contains: —

Length of head	3.85
Distance of snout from vent	4.79
Distance of snout from dorsal	3.75
Distance of snout from anal	3.03
Length of tail (from vent to tip of the caudal)	1.21
Depth of body (at origin of dorsal)	4.71

The head broad and thick; its length is to total length almost as 1 to 4, or, exclusive of the caudal, almost as 1 to $3^1/_2$; its breadth across the cheeks slightly exceeding the length of the postorbital region; snout extremely broad and obtuse.

The front and nape vaulted, with thick subjacent muscles; the bones in the other parts of the cranium merely invested with a thin and lax skin The superior profile line sloping gently downwards, or slightly and

er indfalden mellem Knoglerne, svagt eller uregelmæssigt concav. Hovedet er uvæbnet; paa Praeoperculum kan der under Huden føles enkelte lavere Knuder og Kamme, ligesom lignende Knuder findes over Øjnene, paa Siderne af Nakken, og paa hver Side af Snudespidsen.

Gjællelaagene ere ligeledes beklædte med en løs Hud, og ende bagtil i en Flig, understøttet af en smal og krummet Benknogle; Suboperculum rager ud over Gjællehinden. Gjællespalten er særdeles vid; Afstanden mellem begge Spalters nedre Ende paa Hovedets Underside er blot lidt over en Øjendiameter.

Snudespidsen rager noget frem foran Over- og Mellemkjæven; Underkjæven er ikke ubetydeligt kortere end Overkjæven, som strækker sig tilbage indtil forbi Øjets bagre Rand.

Næseborene ere dobbelte; det bagre Par ligger i omtrent en Øjendiameters Afstand fra Øjet, det forreste omtrent midt mellem det bagre og Snudespidsen. Den indbyrdes Afstand mellem det bagre Par Næsebor er lig Snudens Længde; mellem det forreste Par omtrent det halve.

Øjnene ere forholdsvis smaa, og indeholdes 7 Gange i Hovedets Længde. Bredden mellem Øjnene (Interorbitalrummet) er næsten 3 Gange saa stor, som Øjendiameteren.

Tænderne, der ere tilstede i Mellemkjæverne og Underkjæven, ere yderst fine; de danne her flere Rækker, og ere særdeles tætstaaende. Vomer og Palatinbenene ere glatte.

Finnerne. Dorsalen, der er enkelt, tæller 60 Straaler, som overalt, især i dens forreste Del, ere indbyrdes forbundne med en tyk, fedtlignende Melleinsubstans, over hvilken den løse Hud ligger slapt og bevægeligt; Straalernes Bygning er derfor vanskelig at angive med Sikkerhed. De forreste Straaler ere kløvede til Grunden; de bagre synes at være enkelte, men ere tydeligt articulerede. De første Straaler ere særdeles korte, og hæve sig næsten ikke op over Ryggen; derpaa tiltage de successivt i Længde, indtil Finnen omtrent midt paa Halepartiet har naaet sin største Højde, der omtrent er lig Overkjævens halve Længde. Paa Haleroden staa Straalerne temmelig tæt, men ere endnu forholdsvis lange; den sidste Straale paa Dorsalsiden er med hele sin Længde, der udgjør næsten en Øjendiameter, tilvoxet Caudalen. Dorsalen begynder umiddelbart over Gjællelaagets bagre Flig, saaledes, at dens Afstand fra Snudespidsen indeholdes, ligesom Hovedet, omtrent $3^3/_4$ Gange i Totallængden.

Analen indeholder 57 Straaler, der ere af Bygning temmelig overensstemmende med Dorsalens. De forreste Straaler ere dog ikke fuldt saa korte, som de tilsvarende i Dorsalen, men de længste have næsten samme Højde, som disse; den ophører, ligesom Dorsalen, umiddelbart paa Haleroden, og da dens sidste Straale, der ogsaa her med hele sin Længde er tilvoxet Caudalen, er ubetydeligt længere, end den sidste Dorsalstraale, rager Analen noget længere ud over Caudalen, end Dorsalen, saaledes at den bedækker omtrent $^2/_5$ af denne. Analen udspringer i en Af-

irregularly concave between the bones where the skin is shrunk. The head unarmed; on the preoperculum a few obtuse protuberances and ridges can be felt underneath the skin; similar protuberances occur above the eyes, on both sides of the nape, and at the end of the snout.

The gill-plates are likewise covered with a lax skin, and terminate at the posterior extremity in a rounded flap, supported by a slender and curved bone. The suboperculum extending beyond the branchial membrane. The gill-opening exceedingly wide; distance between its lower extremities on the under surface of the head but slightly exceeding the diameter of the eye.

The point of the snout projecting beyond the superior and the intermaxillaries; lower jaw shorter than upper, the latter extending backwards past the posterior margin of the eye.

Nostrils double; the posterior pair distant about the diameter of the eye from the eye; the anterior situated nearly midway between the posterior and the point of the snout. Distance between the nostrils of the posterior pair equal to the length of the snout, between those of the anterior about half that length.

The eyes comparatively small, their diameter being to the length of the head as 1 to 7. Width of interorbital space almost three times the diameter of the eye.

Teeth on the intermaxillaries and in the lower jaw, exceedingly minute and arranged in several series; the vomer and the palatine bones smooth.

Fins. — One dorsal, furnished with 60 rays, which, more especially in the fore part of the fin, are all of them united together by means of thick adipous tissue, and enveloped in a lax and yielding membrane; hence the structure of the rays is difficult to determine. The anterior rays are cleft to the base; those in the posterior part of the fin appear to be simple, but are distinctly articulated. The foremost rays are exceedingly short, scarcely projecting above the surface of the back; the rest gradually increasing in length till the fin, about the middle of the caudal region, has attained its greatest height, which is about equal to half the length of the upper jaw. The rays at the base of the tail rather close, but here, too, comparatively long; the terminal ray on the dorsal side throughout its entire length, which is nearly equal to the diameter of the eye, connate with the caudal. The dorsal fin originates immediately above the flap of the gill-cover, its distance from the tip of the snout being to the total length about as 1 to $3^3/_4$.

The anal is furnished with 57 rays, in structure closely resembling those of the dorsal. The foremost rays, however, not quite so short as the corresponding rays in the dorsal; but the longest are almost equal in height with those of that fin; it terminates, like the dorsal, in immediate proximity to the caudal fin; and the last of its rays, also connate with the caudal throughout its entire length, being a trifle longer than the last dorsal ray, the anal extends somewhat farther beyond the caudal than does the dorsal, covering about two-fifths of that fin. The anal

stand af næsten en halv Hovedlængde fra Anus, dog forholdsvis langt fortil, idet dens Afstand fra Snudespidsen blot udgjør en Trediedel af Totallængden, saaledes at det egentlige Haleparti kommer til at udgjøre 2 Trediedele af denne.

Caudalen er særdeles smal og langstrakt, samt ubetydeligt tilspidset. Den bestaar af 10 særdeles fine og tætstillede Straaler, hvoraf det yderste Par ere kortere, end de øvrige, der samtlige omtrent have samme Længde; de ere udelte, men fint articulerede. Caudalen, der, som ovenfor nævnt, ved Roden er bedækket af den sidste Dorsal- og Analstraale, har en Længde af omtr. $^1/_{10}$ af Totall.

Pectoralerne udspringe noget bagenfor Anus, lige bag Gjællespalten, saaledes, at deres Rod berøres af Gjællehinden. De tælle 11, paa den anden Side 12 Straaler, der ere delte omtrent fra Midten af. Pectoralens Grundlinie udgjør lidt over Halvdelen af Interorbitalrummets Bredde. De øverste Straaler ere de længste, de følgende efterhaanden kortere; deres største Længde indeholdes i Totallængden næsten 7 Gange. Hele Finnen er yderst blød og bøjelig, samt halvt gjennemsigtig, og indhyllet i den samme løse Hud, som den øvrige Del af Legemet.

Ventralerne ere tilstede som 2 lange Filamenter, hver indhyllet i en tyk Hud, og fæstede til Tungebenet, umiddelbart ved Gjællespaltens nedre Ende. I sin første Halvdel ere de udelte, men dele sig paa Midten i 2 Traade, hvoraf den ene er længere, end den anden. Ventralens hele Længde udgjør hos det eneste undersøgte Individ omtrent $^1/_3$ af Legemets Længde, men varierer sandsynligvis hos Individerne.

Slimporer. Sidelinie eller Skjæl findes ikke. Langs Underkjæven strækker sig en Række af 4 store, aabne Porer, hvoraf den første staar nærved Symphysen, den sidste paa Kjævens bagre Rand. Paa hver Side af Overkjæven, umiddelbart ved Randen, staa 3 lignende Porer, samt en enkelt paa hver Side hen under Øjet.

Farven var overalt mørkt kjødrød med enkelte lysere Skygninger; den var yderst fint og jevnt fordelt, saaledes at tydelige Pigmentpunkter vare ikke synlige. Gjællehinden var intens carmosinrød; Iris var ikke metalliskfarvet, men dybt blaasort. Denne smukke røde Farve er efterhaanden hos det paa Spiritus opbevarede Exemplar, saagodtsom ganske forsvundet, saaledes at dette nu er bleven jevnt hvidagtigt overalt.

Appendices pyloricae, hvis Antal var 10, vare tykke og cylindriske; deres Længde varierede mellem 15^{mm} og 18^{mm}. Bughinden var sort.

Individet var en Han; *Testes,* der dog neppe for Tiden vare i sin fulde Udvikling, havde en Længde af 45^{mm} (den venstre), og 55^{mm} (den højre).

Føde. Ventrikelen, der var særdeles musculøs, indeholdt endnu gjenkjendelige Levninger af Crustaceer, skjønt Individet var ophentet fra den enorme Dybde af næsten 1300 Favne, hvortil var medgaaet flere Timer, og derpaa i en Tid holdt levende ombord. Disse vare 2 Individer

commences nearly half the length of the head posterior to the vent, but comparatively far in front, being distant not more than one-third of the total length from the tip of the snout; and hence the caudal portion of the body equals two-thirds of that length.

The caudal is narrow, elongated, and very slightly pointed. It consists of 10 exceedingly close and slender rays; the outermost pair shorter than the rest, which are nearly uniform in length; they are simple, but minutely articulated. The caudal, covered at the base (as stated above) by the terminal ray in the dorsal and anal, is equal in length to about one-tenth of the total length.

The pectorals commence a short distance posterior to the vent; immediately behind the branchial opening, their base in contact with the branchial membrane. They are furnished on one side with 11, on the other with 12 rays, divided from about the middle. The base of the pectorals measures rather more than half the width of the interorbital space. The uppermost rays are the longest, the rest becoming gradually shorter; their length is to total length nearly as 1 to 7. The whole fin exceedingly soft and flexible, also semi-transparent, and, like the rest of the body, enveloped in a lax integument.

The ventrals occur as two long filaments, each invested with a thick membrane, and attached to the hyoid bone, close to the lower extremity of the gill-openings. In their first half simple, but divided about the middle of the fin into two cirri, one longer than the other. The length of the ventrals in this unicum equals about one-third of the length of the body, but will probably be found to vary in different examples.

Mucous Pores. — No scales or lateral line. Along the under surface, however, extends a row of 4 large, open pores, the first in close proximity to the symphysis, the last on the posterior margin of the jaw. On either side of the upper jaw, contiguous with the margin, are three similar pores, and a solitary pore occurs under each eye.

Colour. — The whole body of a bright red colour, here and there with lighter-tinted cloudings; and this ground-colour being remarkably uniform, no distinct pigmentary specklets were observable. Branchial membrane the brightest of crimsons; irides a deep bluish-black, without metallic lustre. The beautiful red colour has gradually faded, from the action of alcohol (the specimen is preserved in spirits), the fish being now uniformly whitish.

Pyloric appendages 10, thick and cylindric, varying in length from 15^{mm} to 18^{mm}; ventral membrane black.

This individual was a male; length of *testes,* which, however, had hardly then attained their full development, 45^{mm} (the left) and 55^{mm} (the right).

Food. — The ventricle — exceedingly muscular — contained still determinable fragments of crustaceans (and yet the specimen was brought up from the great depth of 1300 fathoms, which took several hours; and it was kept, too, some time alive), viz. 2 examples of *Bythocaris leucopis,*

af *Bythocaris leucopis*, samt 1 af *Pseudomysis abyssi*, begge Arter beskrevne i 1880 af G. O. Sars fra Nordhavs-Expeditionens Indsamlinger, men ingen af dem tidligere fundne i en saa betydelig Dybde. Endelig fandtes et Individ af en endnu ubestemt Hyperide, der sandsynligvis er ubeskreven.

Udbredelse. Det eneste hidtil erholdte Exemplar af denne mærkelige Art havde en Længde af omtrent $^1/_3$ Meter, og optoges, som ovenfor nævnt, fra det iskoldé Vand paa næsten 1300 Favnes Dyb midt ude paa Havet, den 16de Juli 1878, omtrent lige langt fra Spitsbergen, Jan Mayen og Finmarken.

Subord. Physostomi.

Fam. Scopelidae.

Gen. Scopelus, Cuv.

Règne Anim. éd. 1, tom. 2, p. 169 (1817).

32. Scopelus mülleri, (Gmel.) 1788.

Salmo mülleri, Gmel. Lin. Syst. Nat. ed. 13, tom. 1, p. 1378 (1788).
Scopelus glacialis, Reinh. Overs. 1835—36. Kgl. D. Vid. Selsk. Nat. Math. Afh. 6 Del, p. CX. Kbhvn. 1837 (1835—36).
Scopelus mülleri, Coll. Norges Fiske, Tillægsh. til Forh. Vid. Selsk. Chra. 1874, p. 152. Chra. 1875 (1874).

Diagn. *Legemets Højde noget mindre, end Hovedlængden, der indeholdes 4—4½ Gange i Totallængden. Overkjæven gaar tilbage forbi Øjet, og ender triangulært afskaaret ved Randen af Praeoperculum. Dorsalen ligger over Mellemrummet mellem Ventralerne og Analen. Øjet overordentlig stort, indeholdes ikke fuldt 3 Gange i Hovedlængden, og er kun lidet mindre, end Hovedets postorbitale Del. 3 Skjælrækker ovenfor, 4 nedenfor Sidelinien. Skjællene glatte; Sideliniens Skjæl større, end de øvrige. 21—23 Par Pletter langs Buglinien (5 mellem Struben og Ventralerne, 3—4 mellem Ventralerne og Analen; 7—8 langs Analen, 6 mellem Analen og Caudalen). Farven grønlig-brun ovenfil, paa Midten gulagtig sølvglindsende, paa Bugen mørkere olivengrøn.*

D. 12—14; A. 16—18; P. 11; V. 8; C. 7/19/7.
Lin. lat. 36 (Günth.), 38 (Kr.).

and 1 of *Pseudomysis abyssi*, both species described (1880) by G. O. Sars from specimens collected on the North Atlantic Expedition, but not previously met with at so great a depth; finally, an example of a Hyperid, as yet undetermined, and probably undescribed.

Distribution. — The only example of this singular species yet obtained measured in length one-third of a metre, and, as previously mentioned, was taken in the frigid area at a depth of nearly 1300 fathoms, in mid-ocean, the locality being about equidistant from Spitzbergen, Jan Mayen, and Finmark, July 16th 1878.

Subord. Physostomi.

Fam. Scopelidæ.

Gen. Scopelus, Cuv.

Règne Anim. éd. 1, tom. 2, p. 169 (1817).

32. Scopelus mülleri, (Gmel.) 1788.

Salmo mülleri, Gmel. Lin. Syst. Nat. ed. 13, tom. 1, p. 1378 (1788).
Scopelus glacialis, Reinh. Overs. 1835—36. Kgl. D. Vid. Selsk. Nat. Math. Afh. 6 Del, p. CX. Kbhvn. 1837 (1835—36).
Scopelus mülleri, Coll. Norges Fiske, Tillægsh. til Forh. Vid. Selsk. Chra. 1874, p. 152. Chra. 1875 (1874).

Diagnosis. — *Depth of the body a trifle less than the length of the head, which is to total length as 1 to 4—4½. The maxillary extending backwards past the eye, and terminating in a triangular dilatation at the margin of the preoperculum. Dorsal fin placed above the space between the ventrals and the anal. Eyes remarkably large; their longitudinal diameter being to the length of the head very nearly as 1 to 3, and a trifle less than the postorbital region of the head. Above the lateral line 3 rows of scales, below 4. Scales smooth; those on the lateral line larger than the rest. Along the ventral line 21—23 pairs of spots (between the throat and the ventrals 5; between the ventrals and the anal 3 or 4; along the anal 7—8; between the anal and the caudal 6). Colour above a greenish-brown; in the medial region yellowish, with a silvery lustre; on the abdomen, a dark olive green.*

D. 12—14; A. 16—18; P. 11; V. 8; C. 7/19/7.
Lin. lat. 36 (Günth.), 38 (Kr.).

Localit. fra Nordh. Exped. Storeggen udenfor Aalesund (Norge); Havet vestenfor Finmarken.

	Stat. 33.	*Stat.* 295.
Beliggenhed.	Storeggen, 174 Kil. V. Aalesund.	453 Kil. V. Hammerfest.
Dybde.	Flydende i Vandskorpen.	1110 Favne (2030 m).
Temp. paa Bunden.	—	— 1.3° C.
Bunden.	—	Biloculina-Ler.
Datum.	30te Juni 1876.	14de Juli 1878.
Antal Indiv.	1 Indiv.	3 Indiv.

Bemærkninger til Synonymien. Spørgsmaalet om denne Arts Synonymi og rette Benævnelse kan blot løses efter en omhyggelig Prøvelse af en Del Data, hentede fra de af den lærde Præst og Naturforsker H. Strøm efterladte Dagbøger over hans naturhistoriske Observationer i Søndmør (paa Norges Vestkyst) i forrige Aarhundrede, hvilke Dagbøger, der opbevares paa Universitets-Bibliotheket i Christiania, endnu ere utrykte.

I disse Dagbøger[1], der omfatte Aarene 1756—1780, og som danne Grundlaget for de naturhistoriske Capitler i hans bekjendte Skrift, Søndmøres Beskrivelse (1762)[2], med Supplement (1784)[3], findes under Aaret 1766, § 38 anført, at han havde fundet i Stranden en liden Fisk af $2^1/_2$ Tommes Længde, hvilken han derpaa nøjere beskriver. Finnestraalernes Antal opgiver han at være: D. 9; A. 10; P. 15—16; V. 8. I denne Beskrivelse, hvori han især omhandler Hovedets Bygning, gjenkjendes uden Vanskelighed den senere *Maurolicus borealis*, (Nilss.) 1832.

Dernæst findes atter anført for Aaret 1774, § 4, at han den 3die Juni d. A. fangede en sjelden Fisk, der forfulgtes af de andre Smaafiske; ogsaa af denne giver han en temmelig udførlig Beskrivelse, og opfører som dens Straaleantal følgende: D. 11; A. 14; P. 11; V. 8. Han slutter Beskrivelsen med følgende Ord: „Den er saaledes *Coregonus mandibula inferiore majore*", idet han altsaa troede at have den af Artedi som No. 1 beskrevne *Coregonus* for sig.

Da dette sidste Exemplar faldt levende i Strøms Hænder, maa det antages at have været forholdsvis complet, hvorfor Finnestraalernes Antal sandsynligvis er nogenlunde rigtigt angivet. Tages endvidere i Betragtning, hvad han anfører om Hovedets og Tunge-Apparatets Bygning, samt Sølvpuncternes Antal og Stilling, er det klart, at Strøm her har havt for sig en *Scopelus*, forskjellig fra den ovenfor nævnte *Maurolicus borealis*.

[1] „Annotations-Bog over forefaldende Merkværdigheder i Natur-Historien paa Syndmør" (2 Dele. 1756—1780).

[2] „Physisk og Oeconomisk Beskrivelse over Fogderiet Søndmør", 1ste Part (Sorøe 1762).

[3] Nye Saml. Kgl. D. N. Vid. Selsk. Skr., 1 B., p. 103 (Kbhvn. 1784).

Locality (North Atl. Exped.): — The Storeggen bank, off Aalesund (Norway); the open sea, west of Finmark.

	Stat. 33.	*Stat.* 295.
Exact Locality.	Storeggen, 174 Kil. W. Aalesund.	435 Kil. W. Hammerfest.
Depth.	Found floating.	1110 Fathoms (2030 m).
Temp. at Bottom.	—	— 1.3° C.
Bottom.	—	Biloculina Clay.
Date.	30th June 1876.	14th July 1878.
Numb. of Specim.	1 Indiv.	3 Indiv.

Remarks on the Synonymy. — This species cannot be correctly designated without carefully considering certain data from the posthumous Diaries of the Rev. H. Strøm (a scholar, naturalist, and divine) in which he has recorded his observations on natural history taken during the last century in the bailiwick of Søndmør, Norway. These Diaries, which are preserved in the University Library at Christiania, have not yet appeared in print.

In the said Diaries,[1] which extend from 1756 to 1780, and which form the substance of the chapters devoted to Natural History in Strøm's descriptive work on the bailiwick of Søndmør (1762),[2] with a Supplement (1784),[3] the author records (Section 38, *anno* 1766) his having found on the beach a small fish, $2^1/_2$ inches in length, of which he gives a description; the fin-ray formula was D. 9; A. 10; P. 15—16; V. 8. From this description, in which the author specially dwells upon the structure of the head, it is not difficult to recognise the species (afterwards established) *Maurolicus borealis*, (Nilss.) 1832.

Farther on (Section 4, *anno* 1774), it appears that on the 3rd June Strøm captured "a rare fish," which other fishes were in the act of pursuing. Of this specimen, in which the fin-ray formula is stated to have been: D. 11; A. 14; P. 11; V. 8, he also furnishes a comparatively detailed description, his concluding words being as follows: — "Hence it is *Coregonus mandibula inferiore majore;*" for he conceived the species before him to be identical with the *Coregonus* described by Artedi as No. 1.

Having been taken alive, this must in all probability have been a perfect example; and hence the finray formula given by Strøm, is no doubt comparatively correct. Assuming this to be the case, and regard being also had to the other salient characters, viz. the obtuse head, the large scales, the structure of the tongue, and the number and disposition of the argenteous spots, it is evident that Strøm had before him a *Scopelus*, essentially distinct from the above-mentioned *Maurolicus borealis*.

[1] "Annotations-Bog over forefaldende Merkværdigheder i Natur-Historien paa Syndmør" (2 Dele. 1756—1780).

[2] "Physisk og økonomisk Beskrivelse over Fogderiet Søndmør," Part I (Sorøe 1762).

[3] Nye Saml. Kgl. D. N. Vid. Selsk. Skr., 1 B., p. 103 (Kbhvn. 1784).

Strøm har ikke omtalt nogen af disse Fiske i sin Søndmøres Beskrivelse, eller i Supplementerne til denne. Derimod giver han i 1793 i Naturhistorie-Selskabets Skrifter[1] en Meddelelse om et Par sjeldnere norske Fiske, begge ledsagede af en kortfattet Beskrivelse og Afbildning. Den sidste af disse kalder han „en liden rar Fisk, som jeg tog med Haanden af Havstranden for mere end 20 Aar siden“; han nævner endvidere, at han strax havde ladet en Beskrivelse og Afbildning nedsende til O. F. Müller, for at den kunde indtages i dennes „Zoologia Danica“, der netop skulde udkomme. Dette var efter hans Vidende ikke skeet, og han giver derfor paany dens Afbildning og Beskrivelse. Afbildningen fremstiller, som Enhver ser, en *Scopelus*, og ikke *Maurolicus*, men Beskrivelsen gjentager omtrent ordret hans Bemærkninger i Dagbogen af 1766, vedrørende denne sidste Art. Uoverensstemmelserne mellem Tegning og Beskrivelse kan derfor blot forklares paa den Maade, at Strøm ganske har forglemt sin Observation af *Scopelus* for Aaret 1774, men havde sin dengang udførte Tegning i Behold, som nu gjengives tilligemed den *Maurolicus* vedrørende Text fra Aaret 1766.

Müller havde i 1776 i sin „Zoologia Danica“[2] ikkedestomindre omtalt Strøm's Art, men, i Overensstemmelse med Strøm's egne Antydninger, og uden at give den et specielt Artsnavn, henført den blandt Coregonerne som No. 415 med følgende Ord: „*S.(almo) maxillis edentulis, inferiore longiore, ventre punctato. Cl. Strøm misit.*“ Den første Del af denne Diagnose er, som det vil sees, Artedi's ordlydende Diagnose af den senere *Coregonus albula*.

I Overensstemmelse med Müller opfører endelig Gmelin i 1788 i sin 13de Udgave af „Systema Naturae“ Arten som *Salmo mülleri*, men giver ingen anden Oplysning om den, end Müller's Diagnose, der ordret gjengives.

Det kan efter det foranførte ansees for utvivlsomt, at Navnet *Salmo mülleri*, Gmel., ikke kan tilkomme nogen anden, end den af Strøm under Aaret 1774 beskrevne *Scopelus*, men ikke *Maurolicus borealis*, som Kröyer[3] har villet. Denne *Scopelus* er uden Tvivl identisk med Reinhardt's senere beskrevne *Sc. glacialis* fra Grønland, paa hvilken Art Strøm's første Beskrivelse og senere Afbildning i alle Dele synes at passe; sandsynligvis har Reinhardt ikke kjendt den sidste, og heller ikke ventet at gjenfinde sin Art i Gmelin's *Salmo mülleri*.

Bemærkninger til Beskrivelsen. Da Kröyer i 1847 i Naturh. Tidsskr.[4] har leveret en udførlig Beskrivelse af denne Art, og givet dens Afbildning i Gaimard's store Rejseværk, skal jeg nedenfor blot meddele et Par Bemærkninger vedrørende de nye Exemplarer, hvilke desuden ere samtlige i en saa slet Tilstand, at de ere ganske uskikkede til at beskrives i sin Helhed.

[1] Skr. af Naturh. Selsk. 2 B. 2 H., p. 15 (Kbhvn. 1793).
[2] Zool. Dan. Prodr., p. 49 (Havn. 1776).
[3] Danm. Fiske, 3 B., p. 114 (Kbhvn. 1846—49).
[4] Naturh. Tidsskr. 2 R. 2 B. 3 H., p. 230 (Kbhvn. 1847).

Neither in his descriptive work on Søndmør, nor in the Supplement, has Strøm recorded these fishes. But in 1793 a paper by that author on two rare Norwegian fishes, both of which were briefly described, and figured, appeared in the Journal of the Danish Society of Natural History.[1] One he terms "a singular little fish that I found more than 20 years ago on the sea-shore;" and goes on to mention his having forwarded without loss of time a description and drawing of the specimen to O. F. Müller, for insertion in that distinguished naturalist's forthcoming work "Zoologia Danica." No notice having, however, to the best of his knowledge, been taken of this communication, Strøm described and figured the species anew. The representation, as may be seen at a glance, is that of a *Scopelus*, and not of a *Maurolicus*, — but the description an almost verbatim transcript of the observations on the latter species in his Diary for 1766. Now, the manifest discrepancy between the drawing and the description, can be accounted for solely by assuming Strøm to have entirely overlooked his notice of *Scopelus* in 1774, and — the drawing executed on that occasion being still extant — to have annexed it to his diagnosis of *Maurolicus* from 1766.

Müller nevertheless did record the species in his "Zoologia Danica" (1766), but classed it in accordance with Strøm's views, and without assigning any special designation, among the *Coregoni* (No. 415), as follows: — "*S(almo) maxillis edentulis, inferiore longiore, ventre punctato. Cl. Strøm misit.*" The first part of this diagnosis agrees, we see, word for word with Artedi's diagnosis of *Coregonus albula*, subsequently established.

In conformity with Müller's description, Gmelin records the species (1788) in his 13th Edition of "Systema Naturæ" as *Salmo mülleri*, but furnishes no additional information: his diagnosis is a verbatim copy of Müller's.

From the data set forth above, it is obvious that the name *Salmo mülleri* should not, as proposed by Kröyer,[3] be given to *Maurolicus borealis*, but to the *Scopelus* described by Strøm in 1774; and doubtless that *Scopelus* is identical with Reinhardt's *Sc. glacialis*, from Greenland, afterwards diagnosticated, Strøm's description corresponding in every respect with the characters of that species. Probably Reinhardt knew nothing of Strøm's figure, and was not prepared to meet with his species in Gmelin's *Salmo mülleri*.

Descriptive Observations. — Kröyer having furnished in 1847 a full description of this species in "Naturh. Tidsskr.,"[4] and figured it for the plates accompanying Gaimard's great work, I shall confine myself to a few observations on the new specimens, which, besides, are one and all in so mutilated a condition as to render them wholly unfit to serve as subjects for a general description.

[1] Skr. af Naturh. Selsk. 2 B. 2 H., p. 15 (Kbhvn. 1793).
[2] Zool. Dan. Prodr., p. 49 (Havn. 1776).
[3] Danmarks Fiske, 3 B., p. 114 (Kbhvn. 1846—49).
[4] Naturh. Tidsskr. 2 R. 2 B. 3 H., p. 230 (Kbhvn. 1847).

Det første Exemplar, fra Expeditionen i 1876, optoges med det fine Overfladenet fra Vandskorpen paa Fiskebanken Storeggen udenfor Christiansund (Norge), og var øjensynlig udkastet i halvfordøjet Stand af en Fiskemave. Skjælbeklædningen manglede saagodtsom overalt, ligesom mindre Dele af Legemets Sider vare fortærede; derimod vare Finnerne forholdsvis vel vedligeholdte, ligesom de sølvglindsende (phosphorescerende?) Pletter langs Bugen næsten overalt vare i Behold.

De 3 Exemplarer fra Expeditionen i 1878 vare alle noget over halvt udvoxede, og optoges fra Havet langt vestenfor Hammerfest med Trawlnettet, der her naaede Bund paa 1110 Favnes Dyb. Ogsaa her mangler Skjælbeklædningen saagodtsom fuldstændig, og flere Finner ere afbrudte; især er Caudalen defect, saa at Individernes Totallængde ikke nøjagtigt kan opgives.

De langs Ventrallinien løbende sølvglindsende Pletter ere (forsaavidt de kunne sees, eller ere i Behold) fordelte paa følgende Maade:

Mellem Struben og Ventralerne 5 Par; det øverste er bedækket af Gjællelaagene, naar disse ere helt tilsluttede.

Mellem Ventralerne og Analen 4 Par; dette Tal er constant hos alle de af mig hidtil undersøgte Exemplarer. (Kröyer angiver 3 i ovenfor anførte Beskrivelse).

Langs Analen findes 7 Par; hos et i Universitets-Musæet opbevaret nogenlunde fuldstændigt Exemplar fra Hasvig ved Hammerfest er der mellem den 5te og 6te Plet et noget større Mellemrum end mellem de øvrige; hos de 2 af Exemplarerne fra Nordhavs-Expeditionen, hvor disse Pletter ere blevne bevarede, er der derimod et lignende Mellemrum mellem den 6te og 7de Plet.

Mellem Analen og Caudalen findes 6 Par, der alle staa tættere sammen end i de foregaaende Rækker.

Ved Roden af Caudalen nedenfor Midtlinien findes 1 Par.

De forskjellige enkeltstaaende Pletter eller kortere Rækker, der findes hist og her paa Legemets Sider, kunne ikke efter de forhaandenværende Exemplarer beskrives.

De erholdte Exemplarer havde følgende Maal og Straaleantal:

	a. *Stat.* 295.	b. *Stat.* 295.	c. *Stat.* 295.	d. *Stat.* 33.
Totallængde (omtrent)	57 mm	61 mm	62 mm	78 mm
Længde uden Caudalen	50 -	53 -	54 -	70 -
Hovedets Længde	14 -	15 -	15,2 -	18 -
Straaler i Dorsalen	14	13	14	12
Straaler i Analen	17	?	?	16

Straaleantallet i Analen kan blot hos 2 af Individerne med nogenlunde Sikkerhed angives. Hos det ene Exemplar er den sidste Analstraale dobbelt, hvilket er utydeligt hos det andet.

Føde. I Ventrikelen af det ene af de paa Stat. 295 erholdte Individer fandtes Dele af en *Themisto libellula*, Mandt, samt flere Exemplarer af *Concoecia borealis*, G. O.

The first individual, obtained on the cruise in 1876, was taken in the fine-meshed surface-net, on the Storeggen fishing-bank, off Christiansund (Norway), and had evidently been ejected in a half-digested state from a fish's stomach. The scales were almost everywhere wanting; moreover, small portions of the sides of the body had disappeared; the fins, on the other hand, were comparatively uninjured, as also the argenteous (phosphorescent?) spots extending along the abdomen.

The 3 specimens taken on the last cruise of the Expedition, in 1878, were all a little more than half-grown; they were captured at sea, far west of Hammerfest, in the trawl-net, which had been sunk to the depth of 1110 fathoms. On these specimens, too, hardly a scale remains, and several of the fins are broken, more especially the caudal; hence the total length cannot be accurately stated.

The silvery spots along the ventral line were disposed (so far as the condition of the individuals admitted of observing them), in the following order.

Between the throat and the ventrals 5 pairs, the uppermost covered by the gill-plates when the latter are closed.

Between the ventrals and the anal 4 pairs; this number is constant in all the examples I have hitherto examined (Kröyer gives 3 in "Naturh. Tidsskr.").

Along the anal 7 pairs; in a specimen, comparatively perfect, preserved in the University Museum, from Hasvig near Hammerfest, the space between the 5th and 6th spots is somewhat wider than that between the others; 2 of the individuals obtained on the North Atlantic Expedition in which these spots are visible, have a similar space between the 6th and 7th spots.

Between the anal and the caudal 6 pairs, more closely arranged than in any of the foregoing series.

At the origin of the caudal, below the mesial line, 1 pair.

The various isolated spots or shorter series occurring here and there on the sides of the body cannot be determined from the specimens taken on the Expedition.

The measurements and fin-ray formulæ in the specimens obtained were as follows: —

	a. *Stat.* 295.	b. *Stat.* 295.	c. *Stat.* 295.	d. *Stat.* 33.
Total Length (about)	57 mm	61 mm	62 mm	78 mm
Length excl. of Caudal	50 -	53 -	54 -	70 -
Length of Head	14 -	15 -	15.2 -	18 -
Rays in the Dorsal	14	13	14	12
Rays in the Anal	17	?	?	16

The number of fin-rays in the anal could be determined with comparative accuracy in but two of the individuals; one of them had the terminal anal ray double; in the other specimen this character is not distinct.

Food. — The stomach of one of the individuals taken at Station 295 contained fragments of a *Themisto libellula*, Mandt, together with several examples of *Concœcia borealis*,

Sars 1865 (en Ostracode, der hidtil kun er funden langs den norske Kyst paa en Dybde af 300 Favne eller derover).

Udbredelse. Denne arctiske Repræsentant for Slægten var hidtil kjendt fra Grønland og fra de norske Kyster. Overalt er den kun sparsomt erholdt, enten som døde, ilanddrevne Individer, eller udtagne af Sælernes Maver. Af Nordhavs-Expeditionens Individer vare de 3 optagne fra Havet vestenfor Hammerfest; sandsynligvis er Arten udbredt paa gunstige Localiteter over hele Polarhavets Dyb, og vil med mere fuldkomne Redskaber oftere kunne erholdes.

Fra Grønland havde Musæet i Kjøbenhavn, ifølge Reinhardt sen., allerede i 1836 erholdt 6 Individer fra de nordligste Colonier Omenak (Umanak), Ritenbank og Jacobshavn. Senere er flere Exemplarer nedsendte til samme Musæum fra Syd-Grønland.

Fra de norske Kyster kjendtes tidligere blot 3 Individer, hvoraf det første var det, der af Strøm toges ved Volden i Søndmør i 1774; det andet hjembragtes til Bergens Musæum, angivelig fra Hardangerfjorden, af Stiftamtmand Christie mellem Aarene 1830 og 1840. Det tredie, der opbevares paa Universitets-Musæet i Christiania, er indsendt fra Handelspladsen Hasvig ved Hammerfest, og befinder sig, ligesom foregaaende, i mindre god Stand, skjønt ulige bedre, end Nordhavs-Expeditionens Exemplar fra Storeggen; sandsynligvis er ogsaa dette udtaget eller udkastet af en Fiskemave.

En anden Art, *Scopelus resplendens*, Rich. 1845, oprindeligt beskreven fra Guineakysten, har i de sidst forløbne Aar, 1879 og 1880, vist sig at være stationær i Trondhjemsfjorden (63° N. B.), og adskillige Exemplarer ere allerede fundne, hvoraf flere opbevares paa Musæerne i Trondhjem og Christiania[1].

Af en tredie nordisk Art, *Sc. kröyeri*, Malm 1860, er et enkelt Exemplar funden i Maven af en *Gadus morrhua* udenfor Skagen i 1856[2].

[1] Forh. Vid. Selsk. Chra. 1880, No. 8, p. 3.

[2] Forh. Skand. Naturf. 8 Møde Kbhvn. 1860, p. 617 (Kbhvn. 1861).

G. O. Sars 1865 (an Ostracod hitherto not met with on the Norwegian coast at a depth of less than 300 fathoms).

Distribution. — The coast of Greenland and the northern shores of Norway were the only localities in which this Arctic representative of the genus had previously been met with, and but sparingly, for instance floating dead, or washed ashore, or found in the stomachs of seals. Of the individuals obtained on the Expedition, 3 were taken in the open sea west of Hammerfest. Probably the species occurs everywhere throughout the depths of the Polar Sea, and with improved apparatus will no doubt be more frequently captured.

According to Reinhardt sen., the Zoological Museum in Copenhagen had obtained 6 individuals so far back as 1836, from the most northerly colonies in Greenland, viz. Omenak, Ritenbank, and Jacobshavn. Subsequently, divers examples were sent to the same Museum from South Greenland.

On the shores of Norway, but 3 individuals had previously been observed, one of which was the example taken by Strøm at Volden in Søndmør, 1774; the second, stated to have been captured in the Hardanger Fjord, was presented to the Bergen Museum by the Stiftamtmand Christie, between 1830 and 1840. The third, preserved in the University Museum, Christiania, was sent from Hasvig, near Hammerfest; its state of preservation is far from perfect, though better than that of the specimen obtained on the Expedition from the Storeggen fishing-bank; probably this individual too had been in a fish's stomach.

Quite lately (1879 and 1880), another species, *Scopelus resplendens*, Rich. 1845, originally described from the Guinea coast, has been met with as stationary in the Trondhjem Fjord (lat. 63° N.), and several specimens, preserved in the Museums of Trondhjem and Christiania,[1] have been already collected.

A single example of a third Northern species, *Sc. kröyeri*, Malm 1860, was found in the stomach of a *Gadus morrhua*, taken off the Scaw in 1856.[2]

[1] Forh. Vid. Selsk. Chra. 1880, No. 8, p. 3.

[2] Forh. Skand. Naturf. 8 Møde Kbhvn. 1860, p. 617 (Kbhvn. 1861).

Forklaring over Plancherne.

Pl. I.

Fig. 1. *Raja hyperborea*, Han. Oversiden; halv Størrelse.
— 2. *Raja hyperborea*, Han. Undersiden; halv Størrelse.
— 3. *Sebastes marinus*, Yngel; 5 Gange forstørret.
— 4. *Sebastes marinus*, Yngel; 3 Gange forstørret.
— 5. *Cottunculus microps*.
— 6. *Cottunculus microps*. Oversiden.
— 7. *Centridermichthys uncinatus*.
— 8. *Icelus hamatus*, Han.
— 9. *Triglops pingelii*, Han.
— 10. *Triglops pingelii*, Hun.

Pl. II.

Fig. 11. *Agonus decagonus*, Hun.
— 12. *Agonus decagonus*, Han; Undersiden.
— 13. *Eumicrotremus spinosus*.
— 14. *Liparis bathybii*, Hun.
— 15. *Careproctus reinhardi*, yngre Individ.
— 16. *Careproctus reinhardi*, yngre Individ; Undersiden.
— 17. *Lumpenus medius*.
— 18. *Lumpenus maculatus*, Hun.
— 19. *Lycodes esmarkii*, Unge.
— 20. *Lycodes esmarkii*, yngre Han.
— 21. *Lycodes esmarkii*, yngre Hun.

Pl. III.

Fig. 22. *Lycodes esmarkii*, gammel Han; $^2/_3$ Størrelse.
— 23. *Lycodes frigidus*, Yngel.
— 24. *Lycodes frigidus*.
— 25. *Lycodes lütkenii*, Hun.
— 26. *Lycodes pallidus*, Unge.
— 27. *Lycodes pallidus*, yngre Individ.

Explanation of the Plates.

Pl. I.

Fig. 1. *Raja hyperborea*, male (from above); half size.
— 2. *Raja hyperborea*, male (from beneath); half size.
— 3. *Sebastes marinus*, fry; magnified 5 diameters.
— 4. *Sebastes marinus*, fry; magnified 3 diameters.
— 5. *Cottunculus microps*.
— 6. *Cottunculus microps* (from above).
— 7. *Centridermichthys uncinatus*.
— 8. *Icelus hamatus*, male.
— 9. *Triglops pingelii*, male.
— 10. *Triglops pingelii*, female.

Pl. II.

Fig. 11. *Agonus decagonus*, female.
— 12. *Agonus decagonus*, male (from beneath).
— 13. *Eumicrotremus spinosus*.
— 14. *Liparis bathybii*, female.
— 15. *Careproctus reinhardi*, young specimen.
— 16. *Careproctus reinhardi*, young specim. (from beneath).
— 17. *Lumpenus medius*.
— 18. *Lumpenus maculatus*, female.
— 19. *Lycodes esmarkii*, very young.
— 20. *Lycodes esmarkii*, young male.
— 21. *Lycodes esmarkii*, young female.

Pl. III.

Fig. 22. *Lycodes esmarkii*, old male; two-thirds of nat. size.
— 23. *Lycodes frigidus*, fry.
— 24. *Lycodes frigidus*.
— 25. *Lycodes lütkenii*, female.
— 26. *Lycodes pallidus*, very young.
— 27. *Lycodes pallidus*, young specimen.

Pl. IV.

Fig. 28. *Lycodes seminudus*, yngre Individ.
— 29. *Lycodes muraena*, Yngel.
— 30. *Lycodes muraena*, yngre Indiv. (Typ-Exemplaret).
— 31. *Lycodes muraena*, yngre Hun.
— 32. *Gymnelis viridis*, yngre Indiv.
— 33. *Gadus saida*.
— 34. *Onos reinhardi*.
— 35. *Onos septemtrionalis*; Unge.
— 36. *Onos septemtrionalis*. (Typ-Exemplaret).

Pl. V.

Fig. 37. *Rhodichthys regina*, Han.
— 38. *Rhodichthys regina*. Do. Oversiden.
— 39. *Rhodichthys regina*. Do. Undersiden.

Pl. IV.

Fig. 28. *Lycodes seminudus*, young specimen.
— 29. *Lycodes muræna*, Fry.
— 30. *Lycodes muræna*, young specim. (type of the species).
— 31. *Lycodes muræna*, young female.
— 32. *Gymnelis viridis*, young specimen.
— 33. *Gadus saida*.
— 34. *Onos reinhardi*.
— 35. *Onos septemtrionalis*, very young.
— 36. *Onos septemtrionalis*, (type of the species).

Pl. V.

Fig. 37. *Rhodichthys regina*, male.
— 38. *Rhodichthys regina*, „ (from above).
— 39. *Rhodichthys regina*, „ (from beneath).

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Errata.

Page 5, line 4, from foot of page, *for* '349ᵐ' *read* '817.ᵐ'

— 5, line 3, from foot of page, *for* 'grey-green sand' *read* 'grey-green clay.'

— 24, line 57 (the last) *for* 'alimentary canal' *read* 'tubiform house.'

Translated into English by **John Hazeland.**

Coloreringen af Pl. V er efter en Originalskizze udført efter det levende Individ af Maleren Schiertz.

PLANCHER.

DEN NORSKE NORDHAVS-EXPEDITION

1876—1878.

ZOOLOGI.

ANNELIDA,

VED

G. ARMAUER HANSEN.

MED 7 PLANCHER OG 1 KART.

CHRISTIANIA.
GRØNDAHL & SØNS BOGTRYKKERI.
1882.

THE NORWEGIAN NORTH-ATLANTIC EXPEDITION

1876—1878.

LIBRARY OF THE BOMBAY BRANCH OF THE ROYAL ASIATIC SOCIETY

ZOOLOGY.

ANNELIDA,

BY

G. ARMAUER HANSEN.

WITH 7 PLATES AND 1 MAP.

CHRISTIANIA.
PRINTED BY GRØNDAHL & SØN.
1882.

Ved Bestemmelsen af Annelider fra det af den norske Nordhavsexpedition afsøgte Felt er det selvfølgeligt hovedsageligt Malmgrens *"Annulata polychæta"*, der maa benyttes. Saa værdifuldt som dette Arbeide er, saa vanskeligt og oftest umuligt er det at bringe et ukjendt Dyr, som man maatte træffe paa, ind under en af de mange af Malmgren opførte Slægter. Om denne Malmgrens Tilbøielighed til at danne nye Slægter efter ofte meget uvæsentlige Karakterer have allerede flere Forfattere udtalt sig og senest Dr. Thèel [1], der nævner *Polynoidæ, Syllidæ Nereidæ, Ampharetidæ* og *Terebellidæ* som Familier, hvor der fornemmeligst tiltrænges en betydelig Reduktion eller ialfald Modifikation af de malmgrenske Slægter.

Jeg har om de fleste af disse Familier ikke saa talrige selvstændige Undersøgelser og Erfaringer at støtte mig til, at jeg kan udtale mig ganske bestemt herom; men for *Polynoidernes* Vedkommende tør jeg med Sikkerhed sige, at naar Malmgren har delt disse Dyr, der have en saa paafaldende Lighed med hinanden indbyrdes, i ikke mindre end 18 Slægter, af hvilke flere kun ere repræsenterede ved en enkelt Art, da er en saa vidtgaaende Sondring ikke alene unødig, men ogsaa høist uberettiget. For at overbevise sig herom behøver man blot at gjøre, som Møbius har gjort, idet han søger at vise at *Harmothoe imbricata, Evarne impar, Lænilla glabra, Antinoe Sarsi* kun ere forskjellige Navne paa samme Dyr, nemlig stille ved Siden af hinanden Malmgrens Diagnoser af de forskjellige Slægter og bestræbe sig for at finde ud af, hvori Forskjellen mellem dem egentlig bestaar. Man vil strax komme i Forlegenhed hermed og man bliver ikke bedre stillet, om man specielt søger efter de Kjendetegn, som Malmgren selv siger at have benyttet forat karaktisere Slægterne, nemlig Skællenes Antal og den Maade, paa hvilken de bedække Ryggen, Hovedlappens Form og Antennernes Befæstningsmaade, og endelig Børsterne; disse sidste synes Malmgren især at lægge Vægt paa, thi han siger: "De Genuskarakterer, som kunna hentas från fot-

[1] Hj. Théel. Les annélides polychètes des mers de la Nouvelle-Zemble. Stockholm 1879.

In working out the Annelids collected on the Norwegian North-Atlantic Expedition, Malmgren's *"Annulata polychæta"* would of course be the chief book of reference. But, whatever the intrinsic value of this well-known work, it is difficult, nay, in the great majority of cases impossible, to class an unknown Annelid under one of the many genera instituted by Malmgren. The tendency in that distinguished zoologist to establish new genera from non-essential characters, has been previously noticed by several authors, the latest being Dr. Théel,[1] who enumerates the families *Polynoidæ, Syllidæ, Nereidæ, Ampharetidæ,* and *Terebellidæ* as those in which the Malmgren genera are more particularly in need of being reduced in number, or at least diagnostically modified.

My autoptical acquaintance with most of these families is indeed too limited to admit of pronouncing decisively; but as regards the *Polynoidæ,* I do not hesitate to affirm that, in dividing these animals, which bear so striking a resemblance to one another, into no less than 18 genera, many of them represented by only a single species, Malmgren has laid himself open to the charge of introducing needless and suppositious distinctions. And proof of this is readily furnished by instituting a comparison, — as did Möbius, when seeking to show that *Harmothoe imbricata, Evarne impar, Lænilla glabra, Antinoe Sarsi* are merely different names for the same animal, — between Malmgren's diagnoses of the numerous genera, with a view to discover wherein their alleged difference actually consists. But this is no easy matter; the perplexing nature of the attempt becomes at once apparent. Nor does it anyway avail to look for the various criteria selected by Malmgren for characterising the genera, viz. the number of the scales and their arrangement on the back, the form of the lobes of the head, the mode of attachment of the feelers, and finally, the bristles. To the latter Malmgren attaches, it would seem, special weight, as will appear from the following remarks: — "The distinctive features furnished by the structure of the pedal bristles are in my opinion the most

[1] Hj. Théel. Les annélides polychètes des mers de la Nouvelle-Zemble. Stockholm 1879.

borstens bygnad, äro i min tanke de vigtigaste, och ega tvifvelsutan betydelsen af goda genuskarakterar. Deres giltighet som sådana anser jag tilfyllest ådagalagd äfven af den omständigheten, att hos samtliga andra havs *annulata* fotborsten äro danade på samma sät eller efter sama typ hos arterna inom hvarje för ett genus almänt erkänd grupp, ja stundom inom hele familjer. Med olikheten i borstens bygnad följe alltid olikheter i djurets hela utseende och organisation, åtminstone hvad de yttre anatomiske karaktererna beträffer".

Efter de her citerede Ord skulde man vente, at der blandt *Polynoerne* fandtes en temmelig betydelig Forskjellighed, ikke alene med Hensyn til Børsternes Bygning, men ogsa med Hensyn til Dyrenes ydre anatomiske Kjendetegn. Og dog er dette ingenlunde Tilfældet, hvad man ogsaa uden videre kan se af Malmgrens egne Figurer; Dyrene ere hinanden saa lige, at man neppe uden en omhyggelig detaljeret Undersøgelse er istand at skjelne dem fra hinanden; især gjælder dette Exemplarer opbevarede i Alkohol; ja Ligheden gaar saa vidt, at Møbius, som ovenfor nævnt, har ment, at ikke mindre end 4 Dyr, der af Malmgren ere opførte under 4 forskjellige Slægter, kun ere Varieteter af en og samme Form, en Opfatning, som *P. Tauber*[1] ikke alene deler, men yderligere udvider derhen, at han til de 4 Dyr ogsaa føier *Lænilla mollis* og *Lænilla alba* samt *Lagisca rarispina* = *Lagisca propinqva*. Medens Møbius, som allerede omtalt, til Vidnesbyrd om sin Opfatnings Rigtighed dog anfører Malmgrens egne Beskrivelser af de omtalte Dyr, stiller Tauber uden Bemærkninger de af ham medtagne Dyr ind som Synonymer under *Harmothoe imbricata*, medens det dog skulde synes at være en Undersøgelse værd, om ikke de nævnte Dyr ialfald kunde opføres som selvstændige Arter, om de end ikke kunne henføres til egne Slægter. Men jeg maa antage, at Herr Tauber ikke har seet de Dyr, han saaledes slaar sammen med *Harmothoe imbricata*; thi den, der har seet f. Ex. *Lagisca rarispina* kan umuligt tro, at denne og *Harmothoe imbricata* ere samme Dyr. Man behøver ellers kun at se paa Malmgrens Figur af *L. rarispina* for at overbevise sig herom. Medens de af Møbius og Tauber sammenslaaede Dyr utvivlsomt ere vel karaktiserede Arter, kunne de dermod neppe med Rette henføres til særegne Slægter. Og allermindst kan hertil bruges Børsterne, der hos næsten samtlige *Polynoer* ere hinanden saa lige, at det ofte kan have sin store Vanskelighed at kjende dem fra hinanden, og om forskjellige Typer af Børster kan der paa ingensomhelst Maade være Tale. At de dorsale Børster hos somme Dyr ere tykkere eller kortere end de ventrale eller omvendt, samt at de ventrale Børster ere delte eller udelte i Spidsen kan ikke betragtes som forskjellige Typer for Bygningen, ligesom disse smaa Forskjelligheder i Børsteformerne heller ikke give Dyrene nogen særegen Karakter. Typen for Børsterne er den samme for alle *Polynoer* med delvis Undtagelse kun for *Melænis Loveni* og *Polynoe scolopendrina's* Vedkommende, nemlig for de dorsale en let

[1] *Annulata danica.*

important, and must unquestionably rank as true generic characters. Their validity as such is, I think, sufficiently manifest from the fact of the pedal bristles in all other marine *Annulata* having the same structure, or the same type, in the species of every group constituting, as generally understood, a genus; nay sometimes throughout an entire family. Dissimilarity of structure in the bristles is invariably accompanied by general dissimilarity of appearance and organisation, as regards at least the external anatomical characters of the animal."

From what is stated here, a considerable difference might be inferred to exist between the members of the family *Polynoidæ*, and not only as concerns the structure of the bristles, but also with regard to the external anatomical features of the animals. This, however, is not the case, as will at once appear from a glance at Malmgren's own drawings. Indeed, unless carefully examined in detail, it is hardly possible to distinguish between them, so closely do the animals resemble one another. This applies more particularly to specimens preserved in spirits, the resemblance in such being so great, that Möbius, as previously stated, held 4 animals, established by Malmgren as 4 new genera, to be merely varieties of one and the same form, — a view which *P. Tauber*[1] not only shares, but found reason to extend, regarding as additional varieties *Lænilla mollis*, *Lænilla alba*; and *Lagisca rarispina* (*Lagisca propinqva*). Möbius gives, as previously stated, in support of his construction, Malmgren's own diagnoses; whereas Tauber simply refers as synonyms, without remark, the animals in question to *Harmothoe imbricata*. Meanwhile, admitting the establishment of separate genera for the said animals to be out of the question, they are possibly entitled to rank as distinct species. Tauber, however, can hardly know from autopsy the animals he has thus confounded with *Harmothoe imbricata*; for no one who has seen, for instance, *Lagisca rarispina*, can possibly take that animal to be the same as *Harmothoe imbricata*. Indeed, this is sufficiently obvious from Malmgren's drawing. Hence the animals confounded together by Möbius and Tauber are beyond a doubt specifically distinct. To the rank of genera, on the other hand, they can hardly pretend; and certainly the last feature to adduce as a generic character would be, if justly considered, the structure of the bristles, which are so remarkably alike in well-nigh all *Polynoæ*, that very considerable difficulty is frequently experienced in distinguishing between them; and as for types of bristles, there is nothing of the kind, characters founded on such an assumption being altogether spurious. The fact of the dorsal bristles being shorter or thicker than the ventral, or vice-versa, and that of the ventral bristles being cleft or not cleft at the points, cannot be regarded as typical peculiarities of structure; nor do these minute differences in the form of the bristles furnish the animal with any true character, generic or specific. The type of the bristles is the same in all

[1] *Annulata danica.*

krummet bred og tyk Børste, hvis konvexe Rand eller Flade er besat med finere eller grovere Sagtænder i parallele Rader og for de ventrale en lidt svagere bøiet Børste, der paa et tyndere Skaft bærer en knivformig bredere Endedel, der er sågtakket som de dorsale Børster, og hvis Spidse er let krummet, enkelt eller todelt, stundom ret (enkeltvis, *Antinoe Sarsi* og *Melænis Loveni*, udtrukket i en lang, sylformig Spids). Dyrenes ydre Karakterer influeres af Børsterne alene eftersom disse ere kortere eller længere, ikke af de smaa Variationer i Formen, medens dog ingen af Delene har Indflydelse paa Forknudernes Bygning, hvad der sees tydeligt nok hos *Melænis Loveni*, der har den mest afvigende Børsteform, idet de dorsale Børster ere mægtige, sylformige og de ventrale dels særdeles lange og tynde, dels kortere og tykkere med dybt, omtrentlig ligeligt todelt Spids; trods det er Dyrets hele ydre Habitus den almindelige hos de korte *Polynoer*. *Polynoe scolopendrina*, *Enipo Kinbergi*, og *Nemidia Torelli*, der ved sin langstrakte Form og den af Skjælene ubedækkede forholdsvis betydelige Del af Kroppen, saa stærkt skille sig fra de korte Former, vise derimod en forholdsvis kun ringe Afvigelse i Børsteformen, en Afvigelse, der nærmest synes at være afhængig af Børsternes større Spædhed i det Hele, idet den væsentligst bestaar i en manglende eller kun meget fin Sagtanding af de dorsale Børster.

Lige saa lidt som jeg kan finde, at Borsterne afgive noget meget heldigt Grundlag for en naturlig Sondring af *Polynoerne* i saa mange Slægter, ligesaa lidt finder jeg dem skikkede til at lette Diagnosen af Arterne. I denne Henseende synes Skjællene, specielt deres Udseende under Mikroskopet at frembyde større Fordele, idet deres Bygning synes at være aldeles karakteristisk for hver Art, og det er nærmest støttet paa Skjællenes Bygning, at jeg maa nedlægge bestemt Protest mod en saa omfattende Sammenslaaen af Arter og Slægter til en enkelt Art som den af Møbius og efter ham af Tauber foretagne.

Skulde man ville dele de nordiske *Polynoer* i forskjellige Grupper, saa synes den mest naturlige at være den allerede af Ørsted foreslaaede Deling, nemlig at skjelne mellem de lange og de korte Former; men det forekommer mig tvivlsomt, om man er berettiget til at give dem særskilte Slægtsnavne; thi vil man for en naturlig Inddeling tage noget Hensyn til Dyrenes indre anatomiske Bygning, saa vil man vistnok hos alle disse Dyr forgjæves lede efter snart sagt endog den mindste Forskjel i Bygning af Tarmkanal, Nervesystem, Kjønsorganer og Muskelanordning. Nogen aldeles afgjørende Dom kan jeg ikke udtale herom, da de tre ovennævnte Repræsentanter for de lange Former ikke har staaet til min Raadighed til anatomisk Undersøgelse;

Polynoæ, with the exception of *Melænis Loveni* and *Polynoe scolopendrina*, in which it is somewhat modified, those animals having the dorsal bristles broad, thick, and slightly arcuate, with the convex margin or surface more or less minutety serrulated, the teeth being arranged in parallel rows; their ventral bristles, which are also curved, though very slightly, have a thinnish shaft, with a comparatively broad cultrate outer portion, serrate like the dorsal bristles, the point, simple or bipartite, being slightly arcuate, sometimes straight (in *Antinoe Sarsi* und *Melænis Loveni*, produced styliform). It is the relative length of the bristles, and not trifling variations in form, that is found to influence the external characters of the animals; but neither of these subordinate features has the slightest influence on the structure of the pedal protuberances, a fact distinctly apparent on examining *Melænis Loveni*, in which the bristles are most aberrant in form, those on the dorsal surface consisting of powerful, styliform spikes, while those on the ventral are in part exceedingly long and thin, and in part comparatively short and thick, with deeply cleft bipartite points; and yet the habitus of the animal does not differ from that distinguishing the other short *Polynoæ*. Even *Polynoe scolopendrina*, *Enipo Kinbergi*, and *Nemidia Torelli*, so easily distinguished from the short forms by reason of their elongate structure and the portion of the body, comparatively considerable, that is scaleless, exhibit but very slight variation in the bristles, a variation chiefly dependent, it would seem, on greater delicacy of structure, the serrated margin, for instance, distinguishing in other *Polynoæ* the dorsal bristles, being altogether absent, or with the teeth exceedingly minute.

And this, as I conceive, peculiar unfitness of the bristles to furnish a sure and obvious basis on which might be established a natural division of the *Polynoidæ* into numerous genera, extends, I think, with equal force to specific diagnoses. The scales, more especially their appearance under the microscope, afford, in my opinion, far greater distinctive facilities, their form and structure being, it seems, in each species characteristically constant; and it is indeed on grounds derived from a close examiniation of the scales, that I venture emphatically to oppose the wholesale heaping together by Möbius, and after him by Tauber, of proposed genera and species into a single specific group.

Assuming the need of further classification for the northern *Polynoæ*, the most natural would surely be to distinguish, as suggested by Ørsted, between the long and the short forms. Meanwhile, I very much question whether such groups be entitled to generic rank; for if, in that case, any weight must be laid on anatomical structure, it would certainly be hard to find in any of these animals the slightest difference in the stucture of the intestinal canal, the nervous system, the generative organs, or the muscular arrangement. A decided opinion on this subject, I cannot, however, venture to pronounce, my anatomical investigations having been exclusively confined to representatives of the short forms; but after carefully

men efter en nøiagtig Undersøgelse af *Leanira tetragona*'s Anatomi[1] at dømme, trør jeg at kunne antage, at de Dyr, der i ydre Udseende staa de korte Polynoer nærmere end *Leanira*, i anatomisk Henseende kun ville have yderst ringe om overhovedet nogen Afvigelse at frembyde, naar selv *Leanira*, der endog henregnes til en anden Familie, i næsten alle Henseender i sin anatomiske Bygning viser saa store Overensstemmelser med Polynoerne.

Den anatomiske Undersøgelse af *Leanira* blev netop foretagen for at undersøge med hvilken Ret den og *Sigalion* henførtes til en egen Familie, og Undersøgelsens Resultat blev det, at man neppe nok havde Ret at henføre den til en anden Slægt end Polynoerne, end sige til en anden Familie. Og efter en foreløbig Undersøgelse af *Panthalis Ørstedi* samt efter leilighedsvise Indblik i *Aphrodite aculeata*'s og *Lætmonice filicornis*'s Bygning skulde jeg være tilbøielig til at antage, at samtlige elytrebærende Annelider rettest henføres under en Familie.

Jeg giver nedenfor en Fortegnelse over de Stationer, paa hvilke der fangedes Annelider, samt over de Annelider, der ere fundne paa hver af dem tilligemed en Angivelse om Dyrenes øvrige bekjendte Forekomst, idet jeg med Hensyn til denne har holdt mig til de Opgivender, der findes hos

A. I. Malmgren:	*Annulata polychæta.*
P. Tauber:	*Annulata danica.*
Hj. Théel:	Les annélides polychètes des mers de la Nouvelle-Zemble.

Som det vil sees af efterstaaende Fortegnelse er Antallet af Annelider fra de store Dyb og fra den iskolde Area teml. betydeligt og findes der blandt dem Repræsentanter fra næsten samtlige Annelidefamilier. For at dette bedre kan oversees, har jeg nedenfor sammenstillet alle de i den iskolde Area fundne Annelider ordnede efter de Familier, de tilhøre.

Det tør dog være hensigtsmæssigst, før jeg meddeler denne Liste og Betragtninger over Annelidernes Udbredelse inden det undersøgte Havparti, at give en Beskrivelse af de nye Former, der ere fundne, samt nogle Oplysninger om andre mindre kjendte Dyr.

Polynoe globifera, G. O. Sars.

Denne Form er først fundet paa den ydre Afhældning af den store Fiskebanke udenfor Christiansund af Herr Prof. G. O. Sars og af ham beskrevet i Christiania Videnskabsselskabs Forhandlinger 1872.

Da Prof. Sars's Beskrivelse ikke er ledsaget af Tegninger, meddeler jeg saadanne paa T. II Fig. 1—9. Om Elytrerne er at bemærke, at der paa hvert af dem findes

[1] Arkiv for Mathematik og Naturvidenskab.

studying the anatomy of *Leanira tetragona*,[1] I am disposed to assume, that animals bearing in their habitus a stronger resemblance than does *Leanira* to the *Polynoæ*, will be found to exhibit very trifling, if any variation, in their anatomical structure, seeing that *Leanira*, which is even referred to another family, so closely approximates the *Polynoæ* in its general organisation.

My object in studying the anatomical structure of *Leanira*, was to learn on what grounds a separate family had been instituted for that animal and *Sigalion*; but I failed to discover any adequate reason for assigning it generic rank, let alone establishing a new family for its reception. And moreover, I feel disposed to infer from a cursory investigation of *Panthalis Ørstedi* and some acquaintance with the structural features in *Aphrodite aculeata* and *Lætmonice filicornis*, that all scale-bearing Annelids should properly be referred to one family.

Overleaf will be found a List of the Stations at which Annelids were dredged, with a specification of the species brought up in each locality; the geographical distribution elsewhere throughout the seas of the globe has been also given, from statements in the following works: —

A. I. Malmgren:	*Annulata polychæta.*
P. Tauber:	*Annulata danica.*
Hj. Théel:	Les annélides polychètes des mers de la Nouvelle-Zemble.

As will be seen from this List, the number of Annelids obtained from great depths and in the cold area is considerable. Moreover, it comprises representatives from well-nigh every known family; and I have therefore, with a view to facilitate reference, arranged all Annelids found in the cold area under the families to which they belong.

Meanwhile, it will perhaps be best, before giving the List, along with remarks on the distribution of the Annelids throughout the tract of ocean investigated, first to describe the new forms brought to light on the Expedition, and furnish some information respecting other, comparatively little known animals.

Polynoe globifera, G. O. Sars.

This form was first met with on the outer slope of the great fishing-bank off Christiansund, by Professor G. O. Sars, who described it in "Christiania Videnskabsselskabets Forhandlinger," 1872.

No drawing of the animal being annexed to Professor Sars's diagnosis, I have furnished representations in Pl. II, figs. 1—9. As regards the elytræ, must be observed, that

[1] Arkiv for Mathematik og Naturvidenskab.

et blødt Parti udad og bagtil for Stilken; dette Parti er altid indsunket under det øvrige Niveau.

Polynoe aspera, n. sp. Stat. 48.

Længden ca. 2.5^{cm} Bredden 8—9^{mm}. med Børster. 15 Par Elytrer, der dække hele Ryggen. Kroppen fladtrykt, jævnt afsmalnende bagtil. Hovedlappen omtrent lige lang som bred, udtrukket i to temmelig lange Spidser; bagre Par Øine helt bag paa Issen, forreste omtrent midt paa Hovedets ydre Rand (T. II, Fig. 11). Palperne tykke, runde, glatte. Tentakelen og Tentakelcirerrne omtrent jævnlange med dem, fint cilierede ligesom de korte Antenner, der udspringe under Tentakelens Basis, og Dorsalcirrerne, der række noget udenfor Børsterne. Skjellene for det blotte Øie glatte; under Lupen sees fine smaa Punkter paa Fladen og en Krands af korte, tynde Cilier langs den bagre og ydre Rand. Ved stærkere Forstørrelse ser man først tydeligt de haarde Papiller, der dække hele Fladen undtagen en Stribe langs den indre fordre Rand; de ere smaa spidse, koniske Fremragninger, der mod den bagre Rand for en større Del tiltage i Størrelse, enkelte af dem ganske betydeligt (T. II, Fig. 14 & 15); foruden i Randen (tættest udad) findes ogsaa Cilier spredte mellem de haarde Papiller indover Fladen (T. 11, Fig. 15) Fodknuderne ere delte i to temmelig spidst uddragne Børsteknuder (T. II, Fig. 12). Børsterne ere middels lange og smækre, de dorsale noget kortere og tykkere end de ventrale, begge Sorter som vanligt tværtandede, de ventrale dels med hel, dels med svagt todelt Spids (T. II, Fig. 13). Farven: Skjællene mere jævnt eller ujævnt bruntfarvede paa deres bagre Del; samtlige Hovedets Tilhæng bruntfarvede undtagen i Spidsen, der er farveløs. Leddenes Dorsalflader med brune Baand, stærkest farvede udad til Siderne.

Denne Form er af Théel[1] fundet i det Kariske Hav og af mig selv i 1876 ved Moldøen nordenfor Florø.

Af Théel er ikke angivet Vandets Temperatur for de forskjellige Stationer; og for Moldøens Vedkommende er Vandets Temperatur ikke maalt; men da Dyret fandtes paa 100—150 Favnes Dyb i en Fjord, der løber ud i Havet mellem Bremanger og Vaagsøen, er der neppe Grund til at antage, at Temperaturen her har været under 0° *P. aspera* er saaledes ogsaa et Exempel paa et Dyr, der lever baade i den varme og kolde Area. Da jeg i 1878 skrabede paa akkurat de samme Lokaliteter ved Moldøen som i 1876, fandt jeg hverken dette Dyr eller flere andre,

[1] Hj. Théel, l. c. Pag. 10.

each of these organs has a soft section, extending out from and posterior to the pedicle; and this part is invariably depressed, or rather sunk, below the level of the surrounding surface.

Polynoe aspera, n. sp. Stat. 48.

The body, depressed and tapering posteriorly, with 15 pairs of elytræ covering the whole of the back. Extreme length about 2.5^{cm}, breadth from 8^{mm} to 9^{mm}, including the bristles. The lobe of the head, about as long as broad, produced anteriorly each way into 2 comparatively long pointed extremities. The posterior pair of eyes far behind on the crown, the anterior as near as may be in the middle of the outer margin of the head (Pl. II, fig. 11). The palps thick, round, and smooth; the tentacle and the tentacular cirri, about equalling them in length, are finely ciliated, as also the short antennæ, springing from beneath the base of the tentacle, and the dorsal cirri, protending a little beyond the points of the bristles. To the naked eye, scales, or elytræ, smooth; under a lens, their surface is found to be dotted with minute points, and a cincture of short, delicate cilia appears encircling the posterior and outer margin. Not till highly magnified do the hard papillæ which cover the entire surface, saving a strip along the inner margin, become distinctly obvious; they consist of minute acuminate protuberances, increasing in magnitude towards the posterior margin, many of them considerably (Pl. II, figs. 14, 15). Exclusive of those along the margin (densest outwards), are seen other cilia, dispersed between the hard papillæ inwards over the surface, Pl. II, fig. 15. The pedal protuberances occur as two comparatively acuminate bristle-bearing warts, Pl. II, fig 12. The bristles of moderate length, and slender, the dorsal ones somewhat shorter and thicker than the ventral; both, however, transversely denticulated, and the ventral terminating in a point, sometimes simple, sometimes slightly cleft (Pl. II, fig. 13). The colour of the scales on their posterior portion a more or less uniform brown; the appendages of the head all brown, except at the points, which are colourless. The dorsal surface of the segments marked with brown bands, deepest in colour towards the sides.

This form has been found by Théel[1] in the Kara Sea, and by myself off Moldøen, north of Florø.

Théel does not state the temperature of the water at the different observing-stations; as regards Moldø indeed, it was not taken; but the animal having been captured at a depth of 100—150 fathoms, in a fjord disemboguing into the sea between Bremanger and Vaagsø, the temperature can hardly have been lower than 0°. Hence *P. aspera* furnishes an instance of an animal inhabiting both areas, the warm and the cold. When dredging off Moldøen in 1878, in precisely the same localities as in 1876, I met with neither this Annelid nor several other ani-

[1] Hj. Théel, l. c., p. 10.

Oversigtstabel

over de fundne Annelider og de Stationer hvor Dyrene ere fundne.

Station.	Nordlig Bredde.	Længde fra Greenwich.	Dybde. Engelske Favne.	Dybde. Meter.	Vandets Temperatur ved Bunden. C.	Bundens Beskaffenhed.	Fundne Dyr.	Øvrige Forekomst.
							Varme Area.	
1	61° 13′	6° 36′ E.	650	1189	6.°6	Sandler (Sognefjorden).	*Leanira teragona*, Ørst.	Bohuslehn og Norges Kyst, Grønland, Nord-Amerika.
							Cirratulus cirratus, Müller.	Grønland, Nowaja Semlja og Skandinaviens Kyster.
101	65 36	8 32 E.	223	408	6.0	Sandler.	*Onuphis quadricuspis*, M. Sars.	Skandinaviske Halvøs Kyster.
							Serpula vermicularis, Lin.	Skandinavien, England og Frankrige.
147	66 48	12 8 E.	142	260	6.2	Graat Ler.	*Aricia norvegica*, M. Sars.	Norges Kyster.
							Nephtys Hombergi, A. & M. Edw.	Øresund, Bohus og sydlige Norge.
							Lumbrinereis fragilis, Müller.	Grønland, Novaja Semlja, Spitsbergen, Norge, Bohus.
							Ammotrypane aulogaster, Rathke.	Spitsbergen, Grønland, Island og skandinaviske Halvøs Vestkyst.
							Serpula vermicularis, Lin.	Skandinavien, Frankrige og England.
							Hydroides norvegica, Gun.	Bohus til Finmarken.
							Placostegus tridentatus, Fabr.	Do. - Do.
149	67 52	13 57 E.	135	247	4.9	Ler.	*Sabella paronia*, Sav.	England, tyske Nordsøkyst, Norge til Tromsø.
							Clymene biceps, M. Sars.	Island, Bohus til Finmarken.
							Onuphis quadricuspis, M. Sars.	Skandinaviens Vestkyst.
							Hydroides norvegica, Gun.	Bohus til Finmarken.
173^b	69 18	14 32 E.	300	549	4.6	Ler med Sten.	*Leodice norvegica*, Sav.	Bohus til Finmarken, Smeerenberg paa Spitsbergen.
							Sabella paronia, Sav.	England, tyske Nordsøkyst, Norge til Tromsø.
							Hydroides norvegica, Gun.	Bohus til Finmarken.
							Placostegus tridentatus, Fabr.	Do. - Do.
175	69 17	14 34 E.	415	759	3.0	Ler.	*Filigrana implexa*, Berk.	England, Bohus til Finmarken.
							Leodice norvegica, Sav.	Bohus til Finmarken.
							Glycera alba, Rathke.	Øresund til Finmarken, England.
							Onuphis conchylega, M. Sars.	Spitsbergen, Novaja Semlja, Grønland, Norge.
							Terebellides Strömii, M. Sars.	Spitsbergen, Novaja Semlja, Grønland, Island, Skandinavien, England, Østersøen, adriatiske Hav.
257	70 4	23 2 E.	160	293	3.9	Graat Ler. (Altenfjord).	*Polynoe cirrosa*, Pal.	Spitsbergen, Grønland, Island, Bohus til Finmarken.
							— *rarispina*, M. Sars.	Spitsbergen, Grønland, Island, Finmarken.
							Leanira tetragona, Ørst.	Bohus til Finmarken.
							Nephtys ciliata, Müller.	Spitsbergen, Finmarken, Island.
							Pectinaria hyperborea, Mgrn.	Spitsbergen, Grønland, Finmarken.
260	70 55	26 11 E.	127	232	3.5	Ler. (Porsangerfj.).	*Trophonia borealis*, n. sp.	
							Nephtys ciliata, Müller.	Spitsbergen, Finmarken, Island.
							Clymene biceps, M. Sars.	Island, Bohus til Finmarken.
							Praxilla prätermissa, Mgrn.	Bohus til Finmarken.
							Pectinaria hyperborea, Mgrn.	Spitsbergen, Grønland, Finmarken.

List

of the Annelids collected and of the Stations at which they were dredged.

Station.	North Latitude.	Longitude from Greenwich.	Depth. English Fathoms.	Depth. Metres.	Temperature at the Bottom. C.	Bottom.	Specimen.	Geographical Distribution.
							Warm Area.	
1	61° 13′	6° 36′ E.	650	1189	6.°6	Sabulous Clay. (The Sogne Fj.)	*Leanira tetragona*, Ørst.	Bohuslehn and West Coast of Norway, Greenland, North America.
							Cirratulus cirratus, Müller.	Greenland, Novaja Zemlja, and the Coasts of Scandinavia.
101	65 36	8 32 E.	223	408	6.0	Sabulous Clay.	*Onuphis quadricuspis*, M. Sars.	Coasts of the Scandinavian Peninsula.
							Serpula vermicularis, Lin.	Scandinavia, England, and France.
147	66 48	12 8 E.	142	260	6.2	Grey Clay.	*Aricia norvegica*, M. Sars.	Coasts of Norway.
							Nephtys Hombergi, A. & M. Edw.	The Sound, Bohus, and the South Coast of Norway.
							Lumbrinereis fragilis, Müller.	Greenland, Novaja Zemlja, Spitzbergen, Norway, Bohus.
							Ammotrypane aulogaster, Rathke.	Spitzbergen, Greenland, Iceland, and the Western Coast of the Scandinavian Peninsula.
							Serpula vermicularis, Lin.	Scandinavia, France, and England.
							Hydroides norvegica, Gun.	From Bohus to Finmark.
							Placostegus tridentatus, Fabr.	Do. - Do.
149	67 52	13 57 E.	135	247	4.9	Clay.	*Sabella pavonia*, Sav.	England, North-Sea Coast of Germany, Norway, as far north as Tromsø.
							Clymene biceps, M. Sars.	Iceland, from Bohus to Finmark.
							Onuphis quadricuspis, M. Sars.	West Coast of Scandinavia.
							Hydroides norvegica, Gun.	From Bohus to Finmark.
173[b]	69 18	14 32 E.	300	549	4.6	Clay mixed with Stones.	*Leodice norvegica*, Sav.	From Bohus to Finmark, Smeerenberg, Spitzbergen.
							Sabella pavonia, Sav.	England, North-Sea Coast of Germany, Norway, as far north as Tromsø.
							Hydroides norvegica, Gun.	From Bohus to Finmark.
							Placostegus tridentatus, Fabr.	Do. - Do.
175	69 17	14 34 E.	415	759	3.0	Clay.	*Filigrana implexa*, Berk.	England, from Bohus to Finmark.
							Leodice norvegica, Sav.	From Bohus to Finmark.
							Glycera alba, Rathke.	From the Sound to Finmark, England.
							Onuphis conchylega, M. Sars.	Spitzbergen, Novaja Zemlja, Greenland, Norway.
							Terebellides Strömii, M. Sars.	Spitzbergen, Novaja Zemlja, Greenland, Iceland, Scandinavia, England, the Baltic, the Adriatic Sea.
257	70 4	23 2 E.	160	293	3.9	Gray Clay. (The Alten Fj.)	*Polynoe cirrosa*, Pal.	Spitzbergen, Greenland, Iceland, from Bohus to Finmark.
							— *rarispina*, M. Sars.	Spitzbergen, Greenland, Iceland, Finmark.
							Leanira tetragona, Ørst.	From Bohus to Finmark.
							Nephtys ciliata, Müller.	Spitzbergen, Finmarken, Iceland.
							Pectinaria hyperborea, Mgrn.	Spitzbergen, Greenland, Finmark.
260	70 55	26 11 E.	127	232	3.5	Clay. (The Porsanger Fj.)	*Trophonia borealis*, n. sp.	
							Nephtys ciliata, Müller.	Spitzbergen, Finmark, Iceland.
							Clymene biceps, M. Sars.	Iceland, from Bohus to Finmark.
							Praxilla prätermissa, Mgrn.	From Bohus to Finmark.
							Pectinaria hyperborea, Mgrn.	Spitzbergen, Greenland, Finmark.

Station.	Nordlig Bredde.	Længde fra Greenwich.	Dybde. Engelske Favne.	Dybde. Meter.	Vandets Temperatur ved Bunden C.	Bundens Beskaffenhed.	Fundne Dyr.	Øvrige Forekomst.
							Onuphis conchylega, M. Sars.	Spitsbergen, Novaja Semlja, Grønland, Norge.
							Amphicteis Gunneri, M. Sars.	Bohus til Finmarken, Novaja Semlja, Grønland, Spitsbergen, England.
							Aphrodite aculeata, Lin.	Bohus til Finmarken, Engl., Frankrige, Amerika, Middelhavet.
							Terebellides Strömii, M. Sars.	Spitsbergen, Novaja Semlja, Grønland, Island, Skandinavien, England, Østersøen, adriatiske Hav.
261	70° 47′.	28° 30′ E.	127	232	2.°8	Ler. (Tanafjord).	*Clymene lumbricalis*, Fabr.	Spitsbergen, Novaja Semlja, Grønland, Bohus til Finmarken.
							Clymene biceps, M. Sars.	Island, Bohus til Finmarken.
							Leodice norvegica, Sav.	Bohus til Finmarken.
							Nephthys Malmgreni, Théel.	Spitsbergen, Grønland, Finmarken.
							Ammotrypane aulogaster, Rathke.	Spitsbergen, Grønland, Island, Skandinaviske Halvøs Vestkyst.
							Terebellides Strömii, M. Sars.	Spitsbergen, Novaja Semlja, Grønland, Island, Skandinavien, England, Østersøen, adriatiske Hav.
							Sabellides octocirrata, M. Sars.	Bohus til Finmarken.
							Polynoe imbricata, Lin.	Spitsb., Grønland, Island, Skaane til Finmarken, Belgien, England, Frankrige, Nord-Amerika, Middelhavet.
							Pectinaria hyperborea, Mgrn.	Spitsbergen, Grønland, Finmarken.
							Ceratocephale Lovéni, Mgrn.	Bohus.
							Goniada norvegica, Ørst.	Norges Syd- og Vestkyst.
							Amphicteis Gunneri, M. Sars.	Bohus til Finmarken, Spitsbergen, Grønl., Engl., Novaja Semlja.
							Leanira tetragona, Ørst.	Bohus til Finmarken.
262	70 36	32 35 E.	148	271	1.9	Sandler.	*Nephtys Malmgreni*, Théel.	Spitsb., Grønland, Finmarken, Novaja Semlja.
							Clymene lumbricalis, Fabr.	Spitsb., Grønland, Bohus til Finmarken, Novaja Semlja.
							Scolecolepis cirrata, M. Sars.	Spitsb., Grønland, Finmarken og sydover lige til Christianiafjorden, Novaja Semlja.
							Nephtys Hombergi, A. & M. Edw.	Øresund, Bohus, sydlige Norge, Novaja Semlja, Grønland.
							Lumbrinereis fragilis, Müller.	Spitsb., Grønland, Bohus til Finmarken, Novaja Semlja.
270	72 27	35 1 E.	136	249	0.0	Ler.	*Brada granulosa*, n. sp.	Stat. 323.
							Brada granulata, Mgrn.	Spitsb., Grønland, Finmarken, Novaja Semlja.
							Trophonia borealis, n. sp.	
273	73 25	31 30 E.	197	360	2.2	Ler.	*Amphicteis Gunneri*, M. Sars.	Spitsb., Novaja Semlja, Grønland, England, Bohus til Finmarken.
							Nephtys incisa, Mgrn.	Bohus.
							Terebellides Strömii, M. Sars.	Spitsb., Novaja Semlja, Grønland, Island, England, Skandinavien, Østersøen, adriatiske Hav.
							Onyphis conchylega, M. Sars.	Spitsb., Grønland, Norge, Novaja Semlja.

Station.	North Latitude.	Longitude from Greenwich.	Depth. English Fathoms.	Depth. Metres.	Temperature at the Bottom. C.	Bottom.	Specimen.	Geographical Distribution.
							Onuphis conchylega, M. Sars.	Spitzbergen, Novaja Zemlja, Greenland, Norway.
							Amphicteis Gunneri, M Sars.	From Bohus to Finmark, Novaja Zemlja, Greenland, Spitzbergen, England.
							Aphrodite aculeata, Lin.	From Bohus to Finmark, England, France, America, the Mediterranean.
							Terebellides Strömii, M. Sars.	Spitzbergen, Novaja Zemlja, Greenland, Iceland, Scandinavia, England, the Baltic, the Adriatic Sea.
261	70° 47′	28° 30′ E.	127	232	2.°8	Clay. (The Tana Fj.)	*Clymene lumbricalis*, Fabr.	Spitzb., Novaja Zemlja, Greenland, from Bohus to Finmark.
							Clymene biceps, M. Sars.	Iceland, from Bohus to Finmark.
							Leodice norvegica, Sav.	From Bohus to Finmark.
							Nephtys Malmgreni, Théel.	Spitzbergen, Greenland, Finmark.
							Ammotrypane autogaster, Rathke.	Spitzbergen. Greenland, Iceland. Western Coast of Scandinavian Peninsula.
							Terebillides Strömii, M. Sars.	Spitzb., Novaja Zemlja, Greenland, Iceland, Scandinavia, England, the Baltic, the Adriatic Sea.
							Sabellides octocirrata, M. Sars.	From Bohus to Finmark.
							Polynoe imbricata, Lin.	Spitzbergen, Greenland, Iceland, from Scania to Finmark, Belgium, England, France, North America, the Mediterranean.
							Pectinaria hyperborea, Mgrn.	Spitzbergen, Greenland, Finmark.
							Ceratocephale Lovéni, Mgrn.	Bohus.
							Goniada norvegica, Ørst.	South and West Coasts of Norway.
							Amphicteis Gunneri, M. Sars.	From Bohus to Finmark, Spitzbergen, Greenland, England, Novaja Zemlja.
							Leanira tetragona, Ørst.	From Bohus to Finmark.
262	70 36	32 35 E.	148	271	1.9°	Clay.	*Nephtys Malmgreni*, Théel.	Spitzbergen, Greenland, Novaja Zemlja, Finmark.
							Clymene lumbricalis, Fabr.	Spitzbergen, Greenland, from Bohus to Finmark, Novaja Zemlja.
							Scolecolepis cirrata, M. Sars.	Spitzbergen, Greenland, from Finmark southward to the Christiania Fjord, Novaja Zemlja.
							Nephtys Hombergi, A. & M. Edw.	The Sound, Bohus, South Coast of Norway, Novaja Zemlja, Greenland.
							Lumbrinereis fragilis, Müller.	Spitzbergen, Greenland, from Bohus to Finmark, Novaja Zemlja.
270	72 27.5	35 1 E.	136	249	0.0	Brownish Clay.	*Brada granulosa*, n. sp.	Stat. 323.
							Brada granulata, Mgrn.	Spitzbergen, Greenland, Finmark, Novaja Zemlja.
							Trophonia borealis, n. sp.	
273	37 25	31 30 E.	197	360	2.2	Greenish Clay.	*Amphicteis Gunneri*, M. Sars.	Spitzbergen, Novaja Zemlja, Greenland, England, from Bohus to Finmark.
							Nephtys incisa, Mgrn.	Bohus.
							Terebellides Strömii, M. Sars.	Spitzbergen, Novaja Zemlja, Greenland, Iceland, England, Scandinavia, the Baltic, the Adriatic Sea.
							Onuphis conchylega, M. Sars.	Spitzbergen, Greenland, Norway, Novaja Zemlja.

Station.	Nordlig Bredde.	Længde fra Greenwich.	Dybde. Engelske Favne.	Dybde. Meter.	Vandets Temperatur ved Bunden C.	Bundens Beskaffenhed.	Fundne Dyr.	Øvrige Forekomst.
280	74° 10′	18° 51′ E.	35	64	1.°1	Haard (Beeren Eiland).	*Thelepus circinnatus*, Fabr.	Novaja Semlja, Norges Kyster, Bohus, Spitsb., Grønland, England, Middelhavet.
							Nereis pelagica, Lin.	Island, England, Grønland, Øresund, Finm., Spitsb. (sjelden), Novaja Semlja.
							Polynoe scabra, Ørst.	Spitsb., Grønland, Island, Finmarken, N.-Amerika, Novaja Semlja.
							Polynoe imbricata, Lin.	Novaja Semlja, Spitsb., Grønland, Island, Skaane til Finm., Belgien, England, Frankrige, Nord-Amerika, Middelhavet.
290	72 27	20 51 E.	191	349	3.5	Brunt Sandler.	*Lætmonice filicornis*, Kabg.	Bohus til Finmarken, Skotl., Færøerne, Island, Nord-Amerika.
323	72 53	21 51 E.	223	408	1.5	Graat Ler.	*Brada granulata*, Mgrn.	Spitsbergen, Grønland, Finmarken, Novaja Semlja.
							Brada granulosa, n. sp.	Stat. 270.
							Onuphis conchylega, M. Sars.	Spitsbergen, Grønland, Norge, Novaja Semlja.
326	75 31	17 50 E.	123	225	1.6	Grøngraat Ler.	*Nephtys ciliata*, Müller.	Spitsbergen, Finmarken, Grønland, Island, Novaja Semlja.
							Nephtys cœca, Fabr.	Finmarken, Grønland.
							Clymene lumbricalis, Fabr.	Spitsb., Novaja Semlja, Grønland, Bohus til Finmarken.
							Onuphis conchylega, M. Sars.	Spitsb., Grønland, Norge, Novaja Semlja.
							Brada granulata, Mgrn.	Spitsb., Grønland, Finmarken, Novaja Semlja.
357	78 3	11 18 E.	125	229	1.9	Graat Ler.	*Terebellides Strömii*, M. Sars.	Spitsb., Novaja Semlja, Grønland, Island, England, Skandinavien, Østersøen, adriatiske Hav.
							Scolecolepis cirrata, M. Sars.	Spitsb., Grønland, Finmarken, Norges Vestkyst, Novaja Semlja.
							Clymene lumbricalis, Fabr.	Spitsb., Novaja Semlja, Grønland, Bohus til Finmarken.
							Lumbrinereis fragilis, Müller.	Spitsb., Novaja Semlja, Grønland, Bohus til Finmarken.
							Artacama proboscidea, Mgrn.	Spitsb., Novaja Semlja, Grønland, Kattegat, Østersøen.
363	80 3	8 28 E.	260	475	1.1	Blaagraat Ler.	*Polynoe assimilis*, n. sp.	
							Polynoe spinulosa, n. sp.	
							Thelepus circinnatus, Fabr.	Novaja Semlja, Norges Kyster, Bohus, Spitsb., Grønland, England, Middelhavet.
374	78 16	15 38 E.	60	110	0.7	Mørkgraat Ler. (Adventbay).	*Brada inhabilis*, Rathke.	Bohus til Finmarken, Færø, Island, Nord Amerika.
							Pectinaria hyperborea, Mgrn.	Grønland, Finmarken.
							? *Nemidia Torelli*, Mgrn.	Spitsbergen.
							Polynoe cirrosa, Pallas.	Novaja Semlja, Spitsb., Grønland, Skandinavien, England, Nord-Amerika.
							Polynoe imbricata, Lin.	Samme Udbredning.

Station.	North Latitude.	Longitude from Greenwich.	Depth. English Fathoms.	Depth. Metres.	Temperature at the Bottom. C.	Bottom.	Specimen.	Geographical Distribution.
280	74° 10′	18° 51′ E.	35	64	1.°1	Hard. (Beeren Eiland.)	*Thelepus circinnatus*, Fabr.	Novaja Zemlja, Coasts of Norway, Bohus, Spitzbergen, Greenland, England, the Mediterranean.
							Nereis pelagica, Lin.	Iceland, England, Greenland, the Sound, Finmark, Spitzbergen (rare), Novaja Zemlja.
							Polynoe scabra, Ørst.	Novaja Zemlja, Spitzbergen, Greenland, Iceland, Finmark, North America.
							Polynoe imbricata, Lin.	Novaja Zemlja, Spitzbergen, Greenland, Iceland, from Scania to Finmark, Belgium, England, France, North America, the Mediterranean.
290	72 27	20 51 E.	191	349	3.5	Brown Sabulous Clay.	*Lætmonice filicornis*, Kabg.	From Bohus to Finmark, Scotland, the Færoe Islands, Iceland, North America.
323	72 53	21 51 E.	223	408	1.5	Grey Clay.	*Brada granulata*, Mgrn.	Spitzbergen, Greenland, Finmark, Novaja Zemlja.
							Brada granulosa, n. sp.	Stat. 270.
							Onuphis conchylega, M. Sars.	Spitzbergen, Greenland, Norway, Novaja Zemlja.
326	75 31	17 50 E.	123	225	1.6	Greenish-grey Clay.	*Nephtys ciliata*, Müller.	Spitzbergen, Finmark, Greenland, Iceland, Novaja Zemlja.
							Nephtys cœca, Fabr.	Finmark, Greenland.
							Clymene lumbricalis, Fabr.	Spitzbergen, Novaja Zemlja, Greenland, from Bohus to Finmark.
							Onuphis conchylega, M. Sars.	Spitzbergen, Greenland, Norway, Novaja Zemlja.
							Brada granulata, Mgrn.	Spitzbergen, Greenland, Finmark, Novaja Zemlja.
357	78 3	11 18 E.	125	229	1.9	Grey Clay.	*Terebellides Strömii*, M. Sars.	Spitzbergen, Novaja Zemlja, Greenland, Iceland, England, Scandinavia, the Baltic, the Adriatic Sea.
							Scolecolepis cirrata, M. Sars.	Spitzbergen, Greenland, Finmark, West Coast of Norway, Novaja Zemlja.
							Clymene lumbricalis, Fabr.	Spitzbergen, Novaja Zemlja, Greenland, from Bohus to Finmark.
							Lumbrinereis fragilis, Müller.	Spitzbergen, Novaja Zemlja, Greenland, from Bohus to Finmark.
							Artacama proboscidea, Mgrn.	Spitzbergen, Novaja Zemlja, Greenland, the Cattegat, the Baltic.
363	80 3	8 28 E.	260	475	1.1	Bluish Clay.	*Polynoe assimilis*, n. sp.	
							Polynoe spinulosa, n. sp.	
							Thelepus circinnatus, Fabr.	Novaja Zemlja, Coasts of Norway, Bohus, Spitzbergen, Greenland, England the Mediterranean.
374	78 16	15 38 E.	60	110	0.7	Dark-grey Clay. (Advent Bay.)	*Brada inhabilis*, Rathke.	From Bohus to Finmark, the Færoe Islands, North-America.
							Pectinaria hyperborea, Mgrn.	Greenland, Finmark.
							? *Nemidia Torelli*, Mgrn.	Spitzbergen.
							Polynoe cirrosa, Pallas.	Novaja Zemlja, Spitzbergen, Greenland, Scandinavia, England, North America.
							Polynoe imbricata, Lin.	Same Distribution.

Station.	Nordlig Bredde.	Længde fra Greenwich.	Dybde. Engelske Favne.	Dybde. Meter.	Vandets Temperatur ved Bunden C.	Bundens Beskaffenhed.	Fundne Dyr.	Øvrige Forekomst.
							Lumbrinereis fragilis, Müller.	Novaja Semlja, Spitsb., Grønland, Bohus til Finmarken.
							Ammotrypane aulogaster, Rathke.	Spitsb., Grønland, Nord Amerika, England, Skandinavien.
							Terebellides Strömii, M. Sars.	Novaja Semlja, Spitsb., Grønland, Island, England, Skandinavien, Østersøen, Adria.
							Onuphis conchylega, M. Sars.	Novaja Ssmlja, Spitsb., Grønland, Norge.
Røst. . . .	. . . . .	. . . . .	. . .	. . .	. . . .	. . . .	*Polynoe imbricata*, Lin.	Novaja Semlja, Spitsb., Grønland, Skandinavien, England, Nord-Amerika.
							Nephtys ciliata, Müller.	Novaja Semlja, Spitsb., Grønland, Nord-Amerika, Island, Færøerne, Skotland, Skandinavien.
							Phyllodoce teres, Mgrn.	Bohus til Finmarken.
							Nereis pelagica, Lin.	Okotske Hav, Novaja Semlja, Spitsbergen, Jan Mayen, Grønland, Nord-Amerika, Island, Færøerne, Storbrittanien, fra Finmarken til Helgoland.
							Brada granulata, Mgrn.	Novaja Semlja, Spitsb., Grønland, Finmarken.
							Trophonia plumosa, Müller.	Novaja Semlja, Spitsb., Grønland, Færøerne, Engl., Island, Frankrige, Finmarken til Øresund.
							Cirratulus cirratus, Müller.	Novaja Semlja, Grønland, Nord-Amerika, Island, Færøerne, England, Finmarken til Bohus.
							Glycera capitata, Ørst.	Novaja Semlja, Spitsb., Grønland, Island, Skandinavien.
							Chætopterus norvegicus, M. Sars.	Øresund til Finmarken.
							Terebella debilis, Mgrn.	Bohus.
							Pomatocerus triqueter, Mørch.	Finmarken til Østersøen, England, Skotland, Island, Nord-Amerika, Frankrige, Middelhavet.
Sortlandssund . .	. . . . .	. . . . .	. . .	. . .	. . . .	. . . .	*Glycera setosa*, Ørst.	Grønland, Finmarken (?).
							Leanira tetragona, Ørst.	Bohus til Finmarken, Grønland, Nord-Amerika.
Skjærstadfj. . .	. . . . .	. . . . .	263	481	3.°2	Graagrønt Ler.	*Nephtys Hombergi*, A. & M. Edw.	Novaja Semlja, Spitsb., Grønland og lige ind i Middelhavet.
							Lumbrinereis fragilis, Müller.	Novaja Semlja, Spitsb., Grønland. Bohus til Finmarken.
							Goniada maculata, Ørst.	Øresund til Finmarken, Skotland.
							Sabellides octocirrata, M. Sars.	Bohus til Finmarken.
							Amphitrite grönlandica, Mgrn.	Grønland, Finmarken, Danmark, Novaja Semlja.
							Terebellides Strömii, M. Sars.	Novaja Semlja, Spitsb., Grønland, Island, England, Skandinavien, Østersøen, Adria.
							Sabella crassicornis, M. Sars.	Novaja Semlja, Spitsb., Grønland, Finmarken til Molde.
							Pectinaria hyperborea, Mgrn.	Novaja Semlja, Spitsb., Grønland, Finmarken.

Station.	North Latitude.	Longitude from Greenwich.	Depth. English Fathoms.	Depth. Metres.	Temperature at the Bottom. C.	Bottom.	Specimen.	Geographical Distribution.
							Lumbrinereis fragilis, Müller.	Novaja Zemlja, Spitzbergen, Greenland, from Bohus to Finmark.
							Ammotrypane aulogaster, Rathke.	Spitzbergen, Greenland, North America, England, Scandinavia.
							Terebellides Strömii, M. Sars.	Novaja Zemlja, Spitzbergen, Greenland, Icel., Engl., Scandinavia, the Baltic, the Adriatic Sea.
							Onuphis conchylega, M. Sars.	Novaja Zemlja, Spitzb., Greenland, Norway.
Rost	. . . .	. . . . . .	. . .	. . .	. . . .	. . . .	*Polynoe imbricata*, Lin.	Novaja Zemlja, Spitzbergen, Greenland, Scandinavia, England, North America.
							Nephtys ciliata, Müller.	Novaja Zemlja, Spitzbergen, Greenland, North America, Iceland, the Færoe Islands, Scotland, Scandinavia.
							Phyllodoce teres, Mgrn.	From Bohus to Finmark.
							Nereis pelagica, Lin.	The Ochotsk Sea, Novaja Zemlja, Spitzbergen, Jan Mayen, Greenl., North America, Iceland, the Færoe Islands, Great Britain, from Finmark to Helgoland.
							Brada granulata, Mgrn.	Novaja Zemlja, Spitzbergen, Greenland, Finmark.
							Trophonia plumosa, Müller.	Novaja Zemlja, Spitzbergen, Greenland, the Færoe Islands, England, Iceland, France, from Finmark to the Sound.
							Cirratulus cirratus, Müller.	Novaja Zemlja, Greenland, North America, Iceland, the Færoe Islands, England, from Finmark to Bohus.
							Glycera capitata, Ørst.	Novaja Zemlja, Spitzbergen, Greenland, Iceland, Scandinavia.
							Chætopterus norvegicus, M. Sars.	From the Sound to Finmark.
							Terebella debilis, Mgrn.	Bohus.
							Pomatocerus triqueter, Mørch.	From Finmark to the Baltic, England, Scotland, Iceland, North America, France, the Mediterranean.
Sortlandssund.	. . . .	. . . . . .	. . .	. . .	. . . .	. . . .	*Glycera setosa*, Ørst.	Greenland, Finmark. (?)
							Leanira tetragona, Ørst.	From Bohus to Finmark, Greenland, North America.
The Skjærstad Fj.	. . . .	. . . . . .	263	481	3°.2	Grey-green Clay.	*Nephthys Hombergi*, A. & M. Edw.	Novaja Zemlja, Spitzbergen, from Greenland to the Mediterranean.
							Lumbrinereis fragilis, Müller.	Novaja Zemlja, Spitzb., Greenland, from Bohus to Finmark.
							Goniada maculata, Ørst.	From the Sound to Finmark, Scotland.
							Sabellides octocirrata, M. Sars.	From Bohus to Finmark.
							Amphitrite grönlandica, Mgrn.	Greenland, Finmark, Denmark, Novaja Zemlja.
							Terebellides Strömii, M. Sars.	Novaja Zemlja, Spitzbergen, Greenland, Iceland, England, Scandinavia, the Baltic, the Adriatic Sea.
							Sabella crassicornis, M. Sars.	Novaja Zemlja, Spitzbergen, Greenland, from Finmark to Molde.
							Pectinaria hyperborea, Mgrn.	Novaja Zemlja, Spitzbergen, Greenland, Finmark.

Station.	Nordlig Bredde.	Længde fra Greenwich.	Dybde. Engelske Favne.	Dybde. Meter.	Vandets Temperatur ved Bunden C.	Bundens Beskaffenhed.	Fundne Dyr.	Øvrige Forekomst.
Saltstrømmen	. . . . .	. . . . . .	. . .	. . .	. . . . .	. . . .	*Thelepus circinatus*, Fabr.	Novaja Semlja, Spitsb., Beeren-Eiland, Finmarken til Bohus, Grønland, England, Middelhavet.
							Potamilla neglecta, M. Sars.	Florø til Finmarken.
							Glycera capitata, Ørst.	Novaja Semlja, Spitsb., Grønland, Island, Skandinavien.
							Leodice norvegica, Sav.	Spitsb., Finmarken langs Nordsøens Kyster til s. f. Irland, Skotland, Færøerne.
Reykjavik	. . . . .	. . . . . .	. . .	. . .	. . . . .	. . . .	? *Polynoe semisculpta*, Johnst.	
							Polynoe imbricata, Lin.	Novaja Semlja, Spitsb., Grønland, Island, Skaane til Finmarken, England, Belgien, Frankrige, Nord-Amerika, Middelhavet.
Jan Mayen	. . . . .	. . . . . .	10-15	18-27	. . . . .	. . . .	*Travisia forbesi*, Johnst.	Spitsb., Færøerne, Island, Grønland, Østersøen, Nordsøen.
							Aricia arctica, n. sp.	Stat. 224.
							Travisia forbesi, Johnst.	Spitsb., Grønland, Island, Færøerne, Østersøen, Nordsøen.
Beeren Eiland	. . . . .	. . . . . .	15	27	. . . . .	. . . .	*Polynoe Sarsi*, Knbg.	Novaja Semlja, Spitsb., Grønland, Stat. 31, 33, 35, Florø, Christianiafjord.

Kolde Area.

Station.	Nordlig Bredde.	Længde fra Greenwich.	Dybde. Engelske Favne.	Dybde. Meter.	Vandets Temperatur ved Bunden C.	Bundens Beskaffenhed.	Fundne Dyr.	Øvrige Forekomst.
18	62° 44′	1° 48′ E.	412	753	−1°.0	Ler.	*Polynoe globifera*, G. O. Sars.	Stat. 31, 48, 124, 164, 192, 295.
							Nephtys atlantica, n. sp.	Stat. 31, 87.
							Lumbrinereis fragilis, Müller.	Novaja Semlja, Spitsb., Grønland, Bohus til Finmarken.
							Onuphis hyperborea, n. sp.	Stat. 48.
							Scoloplos armiger, Müller.	Spitsb., Grønland, Island, Øresund til Finmarken.
							Scalibregma inflatum, Rathke.	Spitsb., Grønland, Nord-Amerika, Skotland, Shetland, Jan Mayen, Finmarken til Øresund.
							Scalibregma abyssorum, n. sp.	
							Scalibregma ? parvum, n. sp.	Stat. 31.
							Trophonia hirsuta, n. sp.	Stat. 31.
							Notomastus latericius, M. Sars.	Novaja Semlja, Grønland, Bohus til Finmarken.
							Sammytha sexcirrata, M. Sars.	Sydlige Norge, Kattegat, Skotland, Grønland, Nord-Amerika.
							Thelepus circinnatus, Fabr.	Novaja Semlja, Spitsb., Beeren Eiland, Finmarken til Bohus, Grønland, England, Middelhavet.
							Terebellides Strömii, M. Sars.	Novaja Semlja, Spitsb., Grønland, Island, England, Skandinavien, Østersøen, Adria.
31	63 10	5 0 E.	417	763	−1.0	Sandler.	*Polynoe globifera*, G. O. Sars.	Stat. 18, 48, 124, 164, 192, 295.
							— *villosa*, Mgrn.	Bohus, Christianiafjorden, 5 Mil udenfor Sognefjorden.

Station.	North Latitude.	Longitude from Greenwich.	Depth. English Fathoms.	Depth. Metres.	Temperature at the Bottom. C.	Bottom.	Specimen.	Geographical Distribution.
Saltstrømmen . .	. . . .	. . . . . .	. . .	. . .	. . . . . .	. . . .	*Thelepus circinnatus*, Fabr.	Novaja Zemlja, Spitzbergen, Beeren Eiland, from Finmark to Bohus, Greenland, England, the Mediterranean.
							Potamilla neglecta, M. Sars.	From Florø to Finmark.
							Glycera capitata, Ørst.	Novaja Zemlja, Spitzbergen, Greenland, Iceland, Scandinavia.
							Leodice norvegica, Sav.	Spitzbsrgen, Finmark, along the North-Sea coasts to the south of Ireland, Shetland, the Færoe Islands.
Reykjavik . .	. . . .	. . . . . .	. . .	. . .	. . . . . .	. . . .	? *Polynoe semisculpta*, Johnst.	
							Polynoe imbricata, Lin.	Novaja Zemlja, Spitzbergen, Greenland, Iceland, from Scania to Finmark, England, Belgium, France, North America, the Mediterranean.
Jan Mayen	. . . .	. . . . . .	10-15	18-27	. . . . . .	. . . .	*Travisia forbesi*, Johnst.	Spitzbergen, the Færoe Islands, Iceland, Greenland, the Baltic, the North Sea.
							Aricia arctica, n. sp.	Stat. 224.
							Travisia forbesi, Johnst.	Spitzbergen, Greenland, Iceland, the Færoe Islands, the Baltic, the North Sea.
Beeren Eiland	. . . .	. . . . . .	15	27	. . . . . .	. . . .	*Polynoe Sarsi*, Kubg.	Novaja Zemlja, Spitzbergen, Greenland, Stations 31, 33, 35, Florø, the Christiania Fjord.
							Cold Area.	
18	62° 44′	1° 48′ E.	412	753	−1°.0	Clay.	*Polynoe globifera*, G. O. Sars.	Stats. 31, 48, 124, 164, 192, 295.
							Nephtys atlantica, n. sp.	Stats. 31, 87.
							Lumbrinereis fragilis, Müller.	Novaja Zemlja, Spitzbergen, Greenland, from Bohus to Finmark.
							Onuphis hyperborea, n. sp.	Stat. 48.
							Scoloplos armiger, Müller.	Spitzbergen, Greenland, Iceland, from the Sound to Finmark.
							Scalibregma inflatum, Rathke.	Spitzbergen, Greenland, North America, Scotland, the Shetland Islands, Jan Mayen, from Finmark to the Sound.
							Scalibregma abyssorum, n. sp.	
							Scalibregma ? parvum, n. sp.	Stat. 31.
							Trophonia hirsuta, n. sp.	Stat. 31.
							Notomastus latericius, M. Sars.	Novaja Zemlja, Greenland, from Bohus to Finmark.
							Samytha sexcirrata, M. Sars.	South Coast of Norway, the Cattegat, the Shetland Islands, Greenland, North America.
							Thelepus circinnatus, Fabr.	Novaja Zemlja, Spitzb., Beeren Eiland, from Finmark to Bohus, Greenland, England, the Mediterranean.
							Terebellides Strömii, M. Sars.	Novaja Zemlja, Spitzbergen, Greenland, Iceland, England, Scandinavia, the Baltic, the Adriatic Sea.
31	63 10	4 0 E.	417	763	−1.0	Sabulous Clay.	*Polynoe globifera*, G. O. Sars.	Stats. 18, 48, 124, 164, 192, 295.
							— *villosa*, Mgrn.	Bohus, the Christiania Fjord, 5 geographical miles off the mouth of the Sogne Fjord.

Station.	Nordlig Bredde.	Længde fra Greenwich.	Dybde. Engelske Favne.	Dybde. Meter.	Vandets Temperatur ved Bunden C.	Bundens Beskaffenhed.	Fundne Dyr.	Øvrige Forekomst.
							Polynoe Sarsi, Knbg.	Novaja Semlja, Spitsb., Grønland, Stat. 33, 35, Beeren Eiland, Florø, Christianiafjorden.
							Nephtys atlantica, n. sp.	Stat. 18, 87.
							Lumbrinereis fragilis, Müller.	Novaja Semlja, Spitsb., Grønland, Bohus til Finmarken.
							Scalibregma parvum, n. sp.	Stat. 18.
							Trophonia hirsuta, n. sp.	Stat. 18.
							Cirratulus abranchiatus, n. sp.	
							Ammotrypane cylindricaudatus, n. sp.	Stat. 87.
							Ephesia gracilis, Rathke.	Novaja Semlja, Spitsb., Grønland, Molde til Øresund, Vest-Frankrige, England, Skotland, Shetland, Stat. 164.
							Amphicteis Gunneri, M. Sars.	Novaja Semlja, Spitsb., Grønland, England, Bohus til Finmarken.
							Thelepus circinnatus, Fabr.	Novaja Semlja, Spitsb., Beeren Eiland, Grønland, Finmarken til Bohus, England, Middelhavet.
							Chone Duneri, Mgrn.	Spitsbergen.
33	63° 5	3° 0 E.	525	960	—1°.1	Graat Ler.	*Polynoe Sarsi*, Knbg.	Novaja Semlja, Spitsb., Grønland, Stat. 31, 35, Beeren Eiland, Florø, Chrisianiafjord.
							Paramphinome pulchella, M. Sars.	Lofoten til Skagerak, Vest for Skotland og Irland, (Porcupine). Stat. 87.
35	63 17	1 27 W.	1081	1977	—1.0	Biloculinler.	*Sphærodorum abyssorum*, n. sp.	
							Polynoe Sarsi, Knbg.	Novaja Semlja, Spitsb., Grønland, Stat. 31, 33, Beeren Eiland, Florø, Christianiafjorden.
							Notomastus latericius, M. Sars.	Novaja Semlja, Grønland, Bohus til Finmarken.
							Samytha sexcirrata, M. Sars.	Sydlige Norge, Kattegat, Shetland, Grønland, Nord-Amerika.
							Leucariste albicans, Mgrn.	Novaja Semlja, Spitsb., Grønland, Finmarken.
40	63 22	5 29 W.	1215	2222	—1.2	Biloculinler.	*Typhlonereis gracilis*, n. sp.	
							Lumbrinereis fragilis, Müller.	Novaja Semlja, Spitsb., Grønland, Bohus til Finmarken.
							Myriochele Sarsi, n. sp.	Stat. 164, 295, 57.
							Potamilla Malmgreni, n. sp.	Stat. 51.
48	64 36	10 22 W.	299	547	—0.3	Sand og Slik.	*Polynoë globifera*, G. O. Sars.	Stat. 18, 31, 124, 164, 192, 295.
							— *aspera*, n. sp.	Moldøen, Novaja Semlja.
							— *islandica*, n. sp.	
							Lumbrinereis fragilis, Müller.	Novaja Semlja, Spitsb., Grønland, Bohus til Finmarken.
							Onuphis hyperborea, n. sp.	Stat. 18.
							Amphitrite cirrata, Müller.	Novaja Semlja, Spitsb., Grønland, Finmarken til Øresund, England, Middelhavet, Færøerne, Island, Nord-Amerika.
							Thelepus circinnatus, Fabr.	Novaja Semlja, Spitsb., Beeren Eiland, Finmarken til Bohus, Grønland, England, Middelhavet.

Station.	North Latitude.	Longitude from Greenwich.	Depth.		Temperature at the Bottom. C.	Bottom.	Specimen.	Geographical Distribution.
			English Fathoms.	Metres.				
							Polynoe Sarsi, Knbg.	Novaja Zemlja, Spitzb., Greenland. Stats. 33, 35, Beeren Eiland, Florø, the Christiania Fjord.
							Nephthys atlantica, n. sp.	Stats. 18, 87.
							Lumbrinereis fragilis, Müller.	Novaja Zemlja, Spitzb., Greenland, from Bohus to Finmark.
							Scalibregma parvum, n. sp.	Stat. 18.
							Trophonia hirsuta, n. sp.	Stat. 18.
							Cirratulus abranchiatus, n. sp.	
							Ammotrypane cylindricaudatus, n. sp.	Stat. 87.
							Ephesia gracilis, Rathke.	Novaja Zemlja, Spitzb., Greenl., from Molde to the Sound, West Coast of France, Engl., Scotland, the Shetland Islands, Stat. 164.
							Amphicteis Gunneri, M. Sars.	Novaja Zemlja, Spitzb., Greenl., Engl., from Bohus to Finmark.
							Thelepus circinnatus, Fabr.	Novaja Zemlja, Spitzb., Beeren Eiland, Greenl., from Finmark to Bohus, England, the Mediterranean.
							Chone Duneri, Mgrn.	Spitzbergen.
33	63° 5′	3° 0′ E.	525	960	−1°.1	Clay.	*Polynoe Sarsi*, Knbg.	Novaja Zemlja, Spitzb., Greenl., Stats. 31, 35, Beeren Eiland, Florø, the Christiania Fjord.
							Paramphinome pulchella, M. Sars.	From Lofoten to the Skagerak, West of Scotland and Ireland ("Porcupine" Exped.), Stat. 87.
35	63 17	1 27 W.	1081	1977	−1.0	Biloculina Clay.	*Sphærodorum abyssorum*, n. sp.	
							Polynoe Sarsi, Knbg.	Novaja Zemlja, Spitzb., Greenl., Stats. 31, 33, Beeren Eiland, Florø, the Christiania Fjord.
							Notomastus latericius, M. Sars.	Novaja Zemlja, Greenland, from Bohus to Finmark.
							Samytha sexcirrata, M. Sars.	South Coast of Norway, the Cattegat, the Shetland Islands, Greenland, North America.
							Leucariste albicans, Mgrn.	Novaja Zemlja, Spitzb., Greenl., Finmark.
40	63 22	5 29 W.	1215	2222	−1.2	Biloculina Clay.	*Typhlonereis gracilis*, n. sp.	
							Lumbrinereis fragilis, Müller.	Novaja Zemlja, Spitzb., Greenl., from Bohus to Finmark.
							Myriochele Sarsi, n. sp.	Stats. 164, 295, 57.
							Potamilla Malmgreni, n. sp.	Stat. 51.
48	64 36	10 22 W.	299	547	−0.3	Sand and Ooze.	*Polynoe globifera*, G. O. Sars.	Stats. 18, 31, 124, 164, 192, 295.
							— *aspera*, n. sp.	Moldø, Novaja Zemlja.
							— *islandica*, n. sp.	
							Lumbrinereis fragilis, Müller.	Novaja Zemlja, Spitzb., Greenl., from Bohus to Finmark.
							Onuphis hyperborea, n. sp.	Stat. 18.
							Amphitrite cirrata, Müller.	Novaja Zemlja, Spitzb., Greenl., from Finmark to the Sound, England, the Mediterranean, the Færoe Islands, Iceland, North America.
							Thelepus circinnatus, Fabr.	Novaja Zemlja, Spitzb., Beeren Eiland, from Finmark to Bohus, Greenland, England, the Mediterranean.

Station.	Nordlig Bredde.	Længde fra Greenwich.	Dybde. Engelske Favne.	Dybde. Meter.	Vandets Temperatur ved Bunden C.	Bundens Beskaffenhed.	Fundne Dyr.	Øvrige Forekomst.
51	65° 53′	7° 18′ W.	1163	2127	−1°.1	Biloculinler.	*Potamilla Torelli*, Mgrn.	Berufjord paa Island.
							Myriochele Sarsi, n. sp.	Stat. 40, 164, 295.
							Potamilla Malmgreni, n. sp.	Stat. 40.
							Protula arctica, n. sp.	
87	64 2	5 35 E.	498	911	−1.1	Ler.	*Paramphinome pulchella*, M. Sars.	Stat. 33, Lofoten til Skagerak, Vest for Skotland og Irland.
							Ammotrypane cylindricaudatus, n. sp.	Stat. 31.
							Cirratulus abyssorum, n. sp.	
							Notomastus latericius, M. Sars.	Novaja Semlja, Grønland, Bohus til Finmarken.
							Clymene Koreni, n. sp.	
96	66 8	3 0 E.	805	1472	−1.1	Biloculinler	*Lumbrinereis fragilis*, Müller.	Novaja Semlja, Spitsb., Grønland, Bohus til Finmarken.
124	66 41	6 59 E.	350	640	−1.0	Ler.	*Polynoe globifera*, G. O. Sars.	Stat 18, 31, 48, 164, 192, 295.
							Nephthys Malmgreni, Théel.	Novaja Semlja, Spitsb., Grønland, Finmarken, Stat. 192, 312, 338.
							Onuphis conchylega, M. Sars.	Novaja Semlja, Spitsb., Grønland, Nord-Amerika, Finmarken til Bohus, England, Færøerne.
							Trophonia glauca, Mgrn.	Skotland, Shetland, Helgoland, Sydlige Norge, Kattegat, Store Belt
							Potamilla neglecta, M. Sars.	Finmarken, Florø.
							Chone Dunéri, Mgrn.	Spitsbergen.
164	68 21	10 40 E.	457	836	−0.7	Graat Sandler.	*Polynoe globifera*, G. O. Sars.	Stat. 18, 31, 48, 124, 192, 295.
							Onuphis conchylega, M. Sars.	Novaja Semlja, Spitsb., Grønland, Nord-Amerika, Finmarken til Bohus, England, Færøerne.
							Glycera capitata, Ørst.	Novaja Semlja, Spitsb., Grønland, Skandinavien, Britiske Øer, Island, Nord-Amerika.
							Ephesia gracilis, Rathke.	Stat. 31, Novaja Semlja, Spitsbergen, Grønland, Molde til Øresund, Vest-Frankrige, England, Skotland, Shetland.
							Eumenia crassa, Ørst.	Spitsbergen, Norges Kyst og til Øresund, Skotland, Shetland, Hebriderne, Island, Nord-Amerika.
							Myriochele Sarsi, n. sp.	Stat. 40, 51, 295.
							Samytha sexcirrata, M. Sars.	Sydlige Norge, Kattegat, Shetland, Grønland, Nord-Amerika.
							Potamilla neglecta, M. Sars.	Finmarken, Florø.
192	69 46	16 15 E.	649	1187	−0.7	Sandler.	*Polynoe globifera*, G. O. Sars.	Stat. 18, 31, 48, 124, 164, 295.
							Onuphis conchylega, M. Sars.	Novaja Semlja, Spitsb., Grønland, Nord-Amerika, Finmarken til Bohus, England, Færøerne.
							Glycera capitata, Ørst.	Novaja Semlja, Spitsb., Grønland, Skandinavien, Britiske Øer, Island, Nord-Amerika.
							Nephthys Malmgreni, Théel.	Novaja Semlja, Spitsb., Grønland, Finmarken, Stat. 124, 312, 358.
							Myriochele Danielsseni, n. sp.	

Station.	North Latitude.	Longitude from Greenwich.	Depth. English Fathoms.	Depth. Metres.	Temperature at the Bottom. C.	Bottom.	Specimen.	Geographical Distribution.
							Potamilla Torelli, Mgrn.	The Berufjord (Iceland).
51	65° 53′	7° 18′ W.	1163	2127	—1°.1	Biloculina Clay.	*Myriochele Sarsi*, n. sp.	Stats. 40, 164, 295.
							Potamilla Malmgreni, n. sp.	Stat. 40.
							Protula arctica, n. sp.	
87	64 2	5 35 E.	498	911	—1.1	Clay.	*Paramphinome pulchella*, M. Sars.	Stat. 33, from Lofoten to the Skagerak, west of the Scotch and Irish coasts.
							Ammotrypane cylindricaudatus, n. sp.	Stat. 31.
							Cirratulus abyssorum, n. sp.	
							Notomastus latericius, M. Sars.	Novaja Zemlja, Greenland, from Bohus to Finmark.
							Clymene Koreni, n. sp.	
96	66 8	3 0 E.	805	1472	—1.1	Clay.	*Lumbrinereis fragilis*, Müller.	Novaja Zemlja, Spitzb., Greenl., from Bohus to Finmark.
124	66 41	6 59 E.	350	640	—1.0	Clay.	*Polynoe globifera*, G. O. Sars.	Stats. 18, 31, 48, 164, 192, 295.
							Nephthys Malmgreni, Théel.	Novaja Zemlja, Spitzb., Greenl., Finmark, Stats. 192, 312, 338.
							Onuphis conchylega, M. Sars.	Novaja Zemlja, Spitzb. Greenl., North America, from Finmark to Bohus, England, the Færoe Islands.
							Trophonia glauca, Mgrn.	Scotland, the Shetland Islands, Helgoland, South Coast of Norway, the Cattegat, Great Belt.
							Potamilla neglecta, M. Sars.	Finmark, Florø.
							Chone Duneri, Mgrn.	Spitzbergen.
164	68 21	10 40 E.	457	836	—0.7	Grey Sabulous Clay.	*Polynoe globifera*, G. O. Sars.	Stats. 18, 31, 48, 124, 192, 295.
							Onuphis conchylega, M. Sars.	Novaja Zemlja, Spitzb., Greenl., North America, from Finmark to Bohus, England, the Færoe Islands.
							Glycera capitata, Ørst.	Novaja Zemlja, Spitzb., Greenl., Scandinavia, Great Britain, Iceland, North America.
							Ephesia gracilis, Rathke.	Stat. 31, Novaja Zemlja, Spitzbergen, Greenl., from Molde to the Sound, West Coast of France, England, Scotland, the Shetland Islands.
							Eumenia crassa, Ørst.	Spitzbergen, along the coast of Norway to the Sound, Scotland, the Shetland Islands, the Hebrides, Iceland, North America.
							Myriochele Sarsi, n. sp.	Stats. 40, 51, 295.
							Samytha sexcirrata, M. Sars.	South Coast of Norway, the Cattegat, the Shetland Islands, Greenland, North America.
							Potamilla neglecta, M. Sars.	Finmark, Florø.
192	69 46	16 15 E.	649	1187	—0.7	Sabulous Clay.	*Polynoe globifera*, G. O. Sars.	Stats. 18, 31, 48, 124, 164, 295.
							Onuphis conchylega, M. Sars.	Novaja Zemlja, Spitzb., Greenl., North America, from Finmark to Bohus, England, the Færoe Islands.
							Glycera capitata, Ørst.	Novaja Zemlja, Spitzb., Greenl., Scandinavia, British Islands, Iceland, North America.
							Nephthys Malmgreni, Théel.	Novaja Zemlja, Spitzb., Greenl., Finmark, Stats. 124, 312, 358.
							Myriochele Danielsseni, n. sp.	

Station.	Nordlig Bredde.	Længde fra Greenwich.	Dybde.		Vandets Temperatur ved Bunden C.	Bundens Beskaffenhed.	Fundne Dyr.	Øvrige Forekomst.
			Engelske Favne.	Meter.				
							Terebellides Strömii, M. Sars.	Novaja Semlja, Spitsb., Grønland, Island, England, Skandinavien, Østersøen, Adria.
223	70° 54′	8° 24′ W.	70	128	—0°.6	Sort Sand og Ler (Østkysten af Jan Mayen).	*Polynoe arctica*, n. sp.	Stat. 224.
							Lumbrinereis fragilis, Müller.	Novaja Semlja, Spitsb., Grønland, Bohus til Finmarken.
							Onuphis conchylega, M. Sars.	Novaja Semlja, Spitsb., Grønland, Skandinavien, Britiske Øer, Island, Nord-Amerika.
224	70 51	8 20 W.	95	174	—0.6	Sort Sand og Ler (Østkysten af Jan Mayen).	*Polynoe arctica*, n. sp.	Stat. 223.
							Lumbrinereis fragilis, Müller.	Novaja Semlja, Spitsb., Grønland, Bohus til Finmarken.
							Aricia arctica, n. sp.	
							Ammochares assimilis, M. Sars.	Novaja Semlja, Spitsb., Grønland, Finmarken til Øresund, Helgoland, Skotland, Porcupineexpeditionen 1869, Island.
225	70 58	8 4 W.	195	357	—0.6	Ler og Sand.	*Lumbrinereis fragilis*, Müller.	Novaja Semlja, Spitsb., Grønland, Bohus til Finmarken.
							Onuphis conchylega, M. Sars.	Novaja Semlja, Spitsb., Grønland, Skandinavien, Britiske Øer, Island, Nord-Amerika.
							Terebellides Strömii, M. Sars.	Novaja Semlja, Spitsb., Grønland, Island, England, Skandinavien, Østersøen, Adria.
237	70 41	10 10 W.	263	481	—0.3	Brunt, sandholdigt Ler.	*Polynoe arctica*, n. sp.	Stat. 223, 224.
248	67 56	4 11 E.	778	1423	—1.4	Biloculinler.	*Samytha sexcirrata*, M. Sars.	Sydlige Norge, Kattegat, Shetland, Porcupineexped. 1869, Grønland, Nord-Amerika.
251	68 6	9 44 E.	634	1159	—1.3	Sandler.	*Onuphis conchylega*, M. Sars.	Novaja Semlja, Spitsb., Grønland, Skandinavien, Britiske Øer, Island, Nord-Amerika.
							Potamilla neglecta, M. Sars.	Finmarken, Florø.
							Chone Duneri, Mgrn.	Novaja Semlja, Spitsbergen.
							Thelepus circinnatus, Fabr.	Novaja Semlja, Spitsb., Beeren Eiland, Finmarken til Bohus, Grønland, England, Middelhavet.
267	71 42	37 1 E.	148	271	—1.4	Ler, Sten.	*Nephthys ciliata*, Müller.	Novaja Semlja, Spitsb., Grønland, Nord-Amerika, Island, Færøerne, Skotland, Skandinavien.
							Lumbrinereis fragilis, Müller.	Novaja Semlja, Spitsb., Grønland, Bohus til Finmarken.
							Scione lobata, Mgrn.	Novaja Semlja, Spitsb., Grønland.
							Onuphis conchylega, M. Sars.	Novaja Semlja, Spitsb., Grønland, Nord-Amerika, Finmarken til Bohus, England, Færøerne.
275	74 8	31 12 E.	147	269	—0.4	Grønligt Ler.	*Brada granulata*, Mgrn.	Novaja Semlja, Spitsb., Grønland, Finmarken, Røst, Færøerne, Jylland.
							Brada granulosa, n. sp.	Stat. 338.
							Trophonia borealis, n. sp.	
							Polynoe foraminifera, n. sp.	Stat. 338.
							Lumbrinereis fragilis, Müller.	Novaja Semlja, Spitsb., Grønland, Bohus til Finmarken.

Station.	North Latitude.	Longitude from Greenwich.	Depth. English Fathoms.	Depth. Metres.	Temperature at the Bottom. C.	Bottom.	Specimen.	Geographical Distribution.
							Terebellides Strömii, M. Sars.	Novaja Zemlja, Spitzb., Greenl., Iceland, England, Scandinavia, the Baltic, the Adriatic Sea.
223	70° 54′	8° 24′ W.	70	128	—0°.6	Black Sand and Clay. (East Coast of Jan Mayen.)	*Polynoe arctica*, n. sp.	Stat. 224.
							Lumbrinereis fragilis, Müller.	Novaja Zemlja, Spitzb., Greenl., from Bohus to Finmark.
							Onuphis conchylega, M. Sars.	Novaja Zemlja, Spitzb., Greenl., Scandinavia, Great Britain, Iceland, North America.
224	70 51	8 20 W.	95	174	—0.6	Black Sand and Clay. (East Coast of Jan Mayen.)	*Polynoe arctica*, n. sp.	Stat. 223.
							Lumbrinereis fragilis, Müller.	Novaja Zemlja, Spitzb., Greenl., from Bohus to Finmark.
							Aricia arctica, n. sp.	
							Ammochares assimilis, M. Sars.	Novaja Zemlja, Spitzb., Greenl., from Finmark to the Sound, Helgoland, Scotland, "Porcupine" Expedition, 1869, Iceland.
225	70 58	8 4 W.	195	357	—0.6	Clay and Sand.	*Lumbrinereis fragilis*, Lüller.	Novaja Zemljá, Spitzb., Greenl., from Bohus to Finmark.
							Onuphis conchylega, M. Sars.	Novaja Zemlja, Spitzb., Greenl., Scandinavia, Great Britain, Iceland, North America.
							Terebellides Strömii, M. Sars.	Novaja Zemlja, Spitzb., Greenl., Iceland, the Baltic, the Adriatic Sea.
237	70 41	10 10 W.	263	481	—0.3	Brown sabulous Clay.	*Polynoe arctica*, n. sp.	Stats. 223, 224.
248	67 56	4 11 E.	778	1423	—1.4	Biloculina Clay.	*Samytha sexcirrata*, M. Sars.	South Coast of Norway, the Cattegat, the Shetland Islands, "Porcupine" Exped., 1869, Greenl., North America.
251	68 6	9 44 E.	634	1159	—1.3	Sabulous Clay.	*Onuphis conchylega*, M. Sars.	Novaja Zemlja, Spitzb., Greenl., Scandinavia, Great Britain Iceland, North America.
							Potamilla neglecta, M. Sars.	Finmark, Florø.
							Chone Duneri, Mgrn.	Novaja Zemlja, Spitzbergen.
							Thelepus circinnatus, Fabr.	Novaja Zemlja, Spitzb., Beeren Eiland, from Finmark to Bohus, Greenland, England, the Mediterranean.
267	71 42	37 1 E.	148	271	—1.4	Clay, Stones.	*Nephthys ciliata*, Müller.	Novaja Zemlja, Spitzb., Greenl., North America, Iceland, the Færoe Islands, Scotland, Scandinavia.
							Lumbrinereis fragilis, Müller.	Novaja Zemlja, Spitzb., Greenl., from Bohus to Finmark.
							Scione lobata, Mgrn.	Novaja Zemlja, Spitzb., Greenland.
							Onuphis conchylega, M. Sars.	Novaja Zemlja, Spitzb., Greenl., North America, from Finmark to Bohus, England, the Færoe Islands.
275	74 8	31 12 E.	147	269	—0.4	Greenish Clay.	*Brada granulata*, Mgrn.	Novaja Zemlja, Spitzb., Greenl., Finmark, Røst, the Færoe Islands, Jutland.
							Brada granulosa, n. sp.	Stat. 338.
							Trophonia borealis, n. sp.	
							Polynoe foraminifera, n. sp.	Stat. 338.
							Lumbrinereis fragilis, Müller.	Novaja Zemlja, Spitzb., Greenl., from Bohus to Finmark.

Station.	Nordlig Bredde.	Længde fra Greenwich.	Dybde.		Vandets Temperatur ved Bunden C.	Bundens Beskaffenhed.	Fundne Dyr.	Øvrige Forekomst.
			Engelske Favne.	Meter.				
							Spinther arcticus, M. Sars.	Finmarken, sydlige Norge, Danmark, England.
295	71° 59′	11° 40′ E.	1110	2030	−1°.3	Biloculinler.	*Polynoe globifera*, G. O. Sars.	Stat. 18, 31, 48, 124, 164, 192.
							Myriochele Sarsi, n. sp.	Stat. 40, 51, 164.
							Potamilla neglecta, M. Sars.	Finmarken, Florø.
312	74 54	14 53 E.	658	1203	—1.2	Brunt og grønt Ler.	*Thelepus circinnatus*, Fabr.	Novaja Semlja, Spitsb., Beeren Eiland, Finmarken til Bohus, Grønland, England, Middelhavet.
							Nephthys Malmgreni, Théel.	Novaja Semlja, Spitsb., Grønland, Finmarken, Stat. 124, 192, 338.
							Trophonia arctica, n. sp.	
							Anaitis Wahlbergi, Mgrn.	Spitsbergens Vestkyst, Stat. 338.
338	76 19	18 1 E.	146	267	—1.1	Haard.	*Nephthys ciliata*, Müller.	Novaja Semlja, Spitsb., Grønland, Nord-Amerika, Island, Færøerne, Skotland, Skandinavien.
							Nephthys Malmgreni, Théel.	Novaja Semlja, Spitsb., Beeren Eiland, Finmarken til Bohus, Grønland, England, Middelhavet.
							Anaitis Wahlbergi, Mgrn.	Spitsbergens Nordkyst, Stat. 312.
							Brada granulosa, n. sp.	Stat. 275.
							Brada granulata, Mgrn.	Novaja Semlja, Spitsb., Grønland, Finmarken, Røst, Færøerne, Jylland.
							Polynoe foraminifera, n. sp.	Stat. 275.
366	79 35	11 17 E.	61	112	—2.1	Mørkgraat Ler. (Magdalenabay)	*Flabelligera affinis*, M. Sars.	Novaja Semlja, Spitsb., Grønland, Finmarken til Øresund.
							Pista cristata, Müller.	Finmarken til Lille Belt, Skotland, Shetland, Irland, Island, Nord-Amerika.
							Brada inhabilis, Bathke.	Spitsbergen, Finmarken til Bohus, Øresund, Store Belt, Færø, Island, Amerika.
							Nereis zonata, Mgrn.	Novaja Semlja, Spitsb., Grønland.
—	—	—	37	68	—0.2	Mørkgraat Ler. (Magdalenabay)	*Brada inhabilis*, Rathke,	Spitsbergen, Finmarken til Bohus, Øresund, Store Belt, Færøerne, Island, Amerika.
							Lumbrinereis fragilis, Müller.	Novaja Semlja, Spitsb., Grønland, Bohus til Finmarken.
							Nephthys ciliata, Müller.	Novaja Semlja, Spitsb., Grønland, Island, Færøerne, Skotl., Skandinavien.
							Polynoe imbricata, Lin. — *cirrosa*, Pal.	Novaja Semlja, Spitsb., Grønland, Nord-Amerika, England, Skandinavien.
							Trophonia rugosa, n. sp.	
							Eteone spetsbergensis, Mgrn.	Spitsb., Finmarken, Kattegat.
							Terebellides Strömii, M. Sars.	Novaja Semlja, Spitsb., Grønland, Island, England, Skandinavien, Østersøen, Adria.
							Ereutho Smitti, Mgrn.	Spitsb., Grønland, Novaja Semlja, Island, Færøerne, Lille Belt.
							Trichobranchus glacialis, Mgrn.	Novaja Semlja, Spitsb., Grønland, Shetland, Skotland, Kattegat.

Station.	North Latitude.	Longitude from Greenwich.	Depth. English Fathoms.	Depth. Metres.	Temperature at the Bottom. C.	Bottom.	Specimen.	Geographical Distribution.
							Spinther arcticus, M. Sars.	Finmark, South Coast of Norway, Denmark, England.
295	71° 59′	11° 40′ E.	1110	2030	−1°.3	Biloculina Clay.	*Polynoe globifera*, G. O. Sars.	Stats. 18, 31, 48, 124, 164, 192.
							Myriochele Sarsi, n. sp.	Stats. 40, 51, 164.
							Potamilla neglecta, M. Sars.	Finmark, Florø.
312	74 74	14 53 E.	658	1203	−1.2	Brown and Grey Clay.	*Thelepus circinnatus*, Fabr.	Novaja Zemlja, Spitzb., Beeren Eiland, from Finmark to Bohus, Greenland, England, the Mediterranean.
							Nephthys Malmgreni, Thél.	Novaja Zemlja, Spitzb., Greenl., Finmark, Stats. 124, 192, 338.
							Trophonia arctica, n. sp.	
							Anaitis Wahlbergi, Mgrn.	North Coast of Spitzb., Stat. 338.
338	76 19	18 1, E.	146	267	−1.1	Hard.	*Nephthys ciliata*, Müller.	Novaja Zemlja, Spitzb., Greenl., North America, Iceland, the Færoe Islands, Scotland, Scandinavia.
							Nephthys Malmgreni, Théel.	Novaja Zemlja, Spitzb., Beeren Eiland, from Finmark to Bohus, Greenland, England, the Mediterranean.
							Anaïtis Wahlbergi, Mgrn.	North Coast of Spitzb. Stat. 312.
							Brada granulosa, n. sp.	Stat. 275.
							Brada granulata, Mgrn.	Novaja Zemlja, Spitzb., Greenl., Finmark, Røst, the Færoe Islands, Jutland.
							Polynoe foraminifera, n. sp.	Stat. 275.
366	79 35	11 17 E.	61	112	−2.1	Dark-grey Clay (Magdalene Bay).	*Flabelligera affinis*, M. Sars.	Novaja Zemlja, Spitzb., Greenl., from Finmark to the Sound.
							Pista cristata, Müller.	From Finmark to the Little Belt, Scotland, the Shetland Islands, Irel., Icel., North America.
							Brada inhabilis, Rathke.	Spitzbergen, from Finmark to Bohus; the Sound, the Great Belt, the Færoe Islands, America, Iceland.
							Nereis zonata, Mgrn.	Novaja Zemlja, Spitzb., Greenl.
—	—	—	37	68	−0.2	Dark-grey Clay (Magdalene Bay).	*Brada inhabilis*, Rathke.	Spitzbergen, from Finmark to Bohus, the Great Belt, the Færoe Islands, Iceland, America.
							Lumbrinereis fragilis, Müller.	Novaja Zemlja, Spitzb., Greenl., from Bohus to Finmark.
							Nephthys ciliata, Müller.	Novaja Zemlja, Spitzb., Greenl., Iceland, the Færoe Islands, Scotland, Scandinavia.
							Polynoe imbricata, Lin. — *cirrosa*, Pal.	Novaja Zemlja, Spitzb., Greenl., North America, England, Scandinavia.
							Trophonia rugosa, n. sp.	
							Eteone spetsbergensis, Mgrn.	Spitzb., Finmark, the Cattegat.
							Terebellides Strömii, M. Sars.	Novaja Zemlja, Spitzb., Greenl., Iceland, England, Scandinavia, the Baltic, the Adriatic.
							Ereutho Smitti, Mgrn.	Spitzb., Greenl., Novaja Zemlja, Iceland, the Færoe Islands, the Little Belt.
							Trichobranchus glacialis Mgrn.	Novaja Zemlja, Spitzb., Greenl., the Shetland Islands, Scotland, the Cattegat.

Station	Nordlig Bredde.	Længde fra Greenwich.	Dybde.		Vandets Temperatur ved Bunden C.	Bundens Beskaffenhed.	Fundne Dyr.	Øvrige Forekomst.
			Engelske Favne.	Meter.				
							Chone infundibuliformis, Kröyer.	Novaja Semlja Spitsb., Grønland, Jan Mayen, Island, Færøerne, Shetland, Finmarken, sydover til Molde, Øresund.
			20	37	−0°.2	Mørkgraat Ler. (Magdalenabay)	*Polynoe glaberrima*, n. sp.	
							Brada granulosa, n. sp.	
							Brada inhabilis, Rathke.	Spitsb., Finmarken til Bohus, Øresund, Store Belt, Færøerne, Island, Amerika.
							Sabellides borealis, M. Sars.	Novaja Semlja, Spitsb., Grønland, Island, Finmarken.
							Terebellides Strömii, M. Sars.	Novaja Semlja, Spitsb., Grønland, Island, England, Skandinavien, Østersøen, Adria.
							Trophonia arctica, n. sp.	
							Lumbrinereis fragilis, Müller.	Novaja Semlja, Spitsb., Grønland, Bohus til Finmarken.

saaledes *Polynoe nivea*, M. Sars, og *P. propinqva*, Malmgren, som forekom der i det første Aar; men da jeg hverken havde Thermometer eller andre Apparater til Undersøgelse af Vandets Forhold, Bund, Strøm f. Ex., saa har jeg ingen Formodning om Aarsagen til denne faunistiske Skiften, ligesaa lidt som til andre Eiendommeligheder fra samme Sted, som den f. Ex., at nøgne Mollusker, saaledes *Eolis lineata*, fandtes der i 1876 paa 100 Favnes Dyb, medens den ellers her ved Norges Kyster kun findes i Tangbeltet. Imidlertid synes det, som om hverken Dybden eller Temperaturen skulde være det egentlig bestemmende for Dyrenes Forekomst.

Polynoe islandica, n. sp.

Stat. 48.

Et Exemplar, afbrukket noget bagenfor Midten. Det i Alcohol opbevarede Dyr 8 Ctm. langt og omtrent 3.5 Ctm. bredt med Børster. 36 Led, 15 Par Elytrer, der dække hele Ryggen (Tab. I, Fig. 15). (Der medfulgte kun 14 Par, men af Fodknuderne kan det sees, at der maa have været 15 Par). Hovedlappen med to afstumpede Spidser fortil, noget længere end bred; bagerste Par Øine paa Issen, forreste Par midt paa ydre Rand (Tab. I,

mals belonging to the same family, for instance *Polynoe nivea*, M. Sars, and *P. propinqva*, Malmgren, which had been found to occur there on the first cruise. But happening not to have with me a thermometer, or any other instrument necessary for investigating the physical conditions of the water of the ocean, nature of bottom, velocity and direction of currents, &c., I can suggest no reason whatever for this partial shifting of the Fauna, nor indeed for any of the other zoological phenomena observed in that region; for instance, the occurrence of naked mollusca, such as *Eolis lineata*, at the depth of 100 fathoms (1876), specimens of that species having never previously been taken on the coasts of Norway out of the wrack-zone. Meanwhile, it would seem that neither depth nor temperature exerts with these animals any material influence on the choice of a habitat.

Polynoe islandica, n. sp.

Stat. 48.

One specimen only, with hind part body broken off a little posterior to the middle. Extreme length 8cm, breadth about 3.5cm. This individual, preserved in alcohol, has 36 segments, and 15 pairs of elytræ covering the whole of the back, Pl. I, fig. 15. (Only 14 pairs were actually counted, but the pedal protuberances plainly show the original number to have been 15). The lobe of the head, with two obtuse points anteriorly, somewhat longer than

Station.	North Latitude.	Longitude from Greenwich.	Depth. English Fathoms.	Depth. Metres.	Temperature at the Bottom. C.	Bottom.	Specimen.	Geographical Distribution.
							Chone infundibuliformis, Kröyer.	Novaja Zemlja, Spitzb., Greenl., Jan Mayen, Iceland, the Færoe Islands, the Shetland Islands, from Finmark southward to Molde, the Sound.
			20	37	—0°.2	Dark grey Clay (Magdalene Bay)	*Polynoe glaberrima*, n. sp.	
							Brada granulosa, n. sp.	
							Brada inhabilis, Rathke.	Spitzbergen, from Finmark to Bohus, the Sound, the Great Belt, the Færoe Islands, Iceland, America.
							Sabellides borealis, M. Sars.	Novaja Zemlja, Spitzb., Greenl., Iceland, Finmark.
							Terebellides Strömii, M. Sars.	Novaja Zemlja, Spitzb., Greenl., Iceland, England, Scandinavia, the Baltic, the Adriatic Sea.
							Trophonia arctica, n. sp.	
							Lumbrinereis fragilis, Müller.	Novaja Zemlja, Spitzb., Greenl., from Bohus to Finmark.

Fig. 16). Palperne, med 6 Papillerader, omtrent 4 Gange længere end Hovedet; Tentakelbasis tyk, Tentakelen selv tynd, ikke fuldt saa lang som Palperne; Tentakelcirrerne af Tentakelens Længde; Antennerne af Hovedets Længde. Disse tynde Hovedtilhæng have en spindelformig Opdrivning nedenfor den tynde Spids, og ere glatte, medens Dorsalcirrerne, der rage noget udenfor Børsterne og have Form som Hovedtilhængene, ere tæt cilierede. Skællene ere samtlige, ogsaa første Par, aflangt nyreformige, besatte ved den bagre Rand med 2 eller 3 store koniske mørke Papiller og langs ydre Rand med 5—8 lysegule (Tab. I, Fig. 17). Under Lupen opdager man smaa haarde Knuder over hele Fladen af Skællet undtagen langs indre fordre Rand. Disse smaa Knuder ere halvkugleformige eller noget aflange og dels mørkebrune, dels lysegule, medens de store Papiller i Randen ere koniske og i Spidsen delte i et Bundt korte, jevntykke Takker (Tab. I, Fig. 18). Langs ydre Rand en Rad af tætstaaende, temmelig korte Cilier, der ogsaa findes sparsomt langs bagre Rand samt indover den ydre bagre Del af Fladen. Fødderne med kort, tyk Dorsalknude og temmelig langt fremragende Ventralknude, samt med en kort Ventralcirre, der ikke naar hen til Spidsen af Fodknuden (Tab. I, Fig. 19). De dorsale Børster noget kortere end, men omtrent ligesaa tykke som de ventrale Børster, der have en udelt Spids og ere noget grovere tvertandede end de dorsale, der ere meget tæt og fint tandede (Tab. I, Fig. 20 og 21). Farven paa Skællene er brun midt paa den bagre Del af Fladen og gaar til begge Sider over i lysegult. Kroppen er farveløs. Paa Dorsalcirrerne og de tynde Hovedtilhæng et brunt Baand nedenfor Spidsen.

broad. The posterior pair of eyes on the crown, the anterior pair in the middle of the outer margin, Pl. I, fig. 16. The palps, with 6 rows of papillæ, about 4 times as long as the head; base of tentacle thick, the tentacle itself slender, not quite so long as the palps; the tentacular cirri of the same length as the tentacle, the antennæ as the head. These delicate appendages are distinguished by a fusiform swelling below the slender extremity; they have a smooth surface, whereas the dorsal cirri, of the same form as the said appendages, and projecting a little beyond the bristles, are densely ciliated. The scales (including the first pair) are all ovato-reniform, furnished down the posterior margin with 2 or 3 large, conical, dark-coloured papillæ, and along the outer margin, with from 5 to 8 of a lightish yellow (Pl. I, fig. 17). Viewed through a lens, the entire surface of the scales, excepting only the inner anterior margin, is found to be covered with minute hard protuberances. These minute protuberances are in form either semi-globose or somewhat oblong, and in colour partly dark-brown, partly light-yellow; whereas the large papillæ on the margin are conical, and divided at the point, which consists of a fascicle of short spikes, uniform in thickness (Pl. I, fig. 18). Along the outer margin is seen a series of closely set, comparatively short cilia, which occur, too, sparingly distributed, along the posterior margin, and, extending inwards, also over the outer posterior portion of the surface. The parapodia have short, thick dorsal and comparatively long ventral protuberances, together with a short ventral cirrus, which does not reach to the extremity of the pedal protuberance (Pl. I, fig. 19). The dorsal bristles somewhat shorter than, but nearly equal in thickness to, the ventral, which have the points simple, and are much more coarsely dentated than the dorsal, the latter being exceed-

Denne *Polynoe* har megen Lighed med *Eunoe Oerstedi*, Malmgren, og *Eunoe nodosa*, M. Sars, men skiller sig fra begge derved, at Hovedets tynde Tilhæng ere ucilierede og ved Skællenes Form, idet ogsaa første Par Skæl ere nyreformigt aflange, samt ved Skællenes Bygning.

ingly dense and minutely serrate (Pl. I, figs. 20, 21). The colour of the scales is brown in the middle of the posterior portion of the surface, changing to light-yellow along the sides. The body itself colourless. On the dorsal cirri and the delicate appendages of the head a brown band below the points.

This *Polynoe* bears a close resemblance to *Eunoe Oerstedi*, Malmgren, and to *Eunoe nodosa*, M. Sars, but differs from both in not having the delicate appendages to the head ciliated, — also in the form of the scales (the first pair being like the rest ovato-reniform) and in their general structure.

Polynoe semisculpta, Johnston (?).

Reykjavik.

Da jeg ikke er ganske sikker paa Diagnosen hidsætter jeg en Beskrivelse af Dyret.

40 Led, 15 Par Elytrer, de bagerste Led ubedækkede. Hovedlappen ligesaa bred som lang. Bagre Par Øine paa Issen, forreste Par midt paa ydre Rand. Palperne ligesom Tentakelen og Tentakelcirrerne omtrent $2^1/_2$ Gange saa lange som Hovedet, Antennerne $^1/_2$ Gang saa lange som Palperne (Tab. III, Fig. 16). Tentakel, Antenner og Tentakelcirrer ere ligesom Dorsalcirrerne tæt cilierede. Fødderne, delte i to omtrent lige lange Børsteknuder, med en kort Ventralcirre (Tab. III, Fig. 17). De dorsale Børster kun lidt mere end halvt saa lange som de ventrale, lidt tykkere end disse, samt fint tværtandede. De ventrale Børster med todelt Spids og meget grovere tværtandede (Tab. III, Fig. 18). Elytrerne for det blotte Øie glatte med endel smaa, mørke, aflange Knuder langs bagre Rand; første Par runde, de derpaa følgende nyreformige, derefter aflange, og de bagerste ægformige med den længste Axe rettet forfra bagtil. Under Mikroskopet vise Skællene over hele Fladen undtagen fortil og indad en Besætning af smaa i Spidsen todelte haarde Knuder (Tab. III, Fig. 19 og 20). De større Papiller i Randen ere kølleformige og sidde paa en blød Stilk (Fig. 20). Langs ydre Rand staar der tæt, langs bagre Rand sparsomt Cilier. Farven er paa Skællene brun, Hovedet farveløst, Tilhængene brune, Ryggen farveløs.

Polynoe semisculpta, Johnston (?).

Reykjavik.

As it is not quite clear from the diagnosis whether this Annelid be strictly identical with Johnston's species, I will briefly describe it.

Forty segments, 15 pairs of elytræ; the posterior segments naked. The lobe of the head as broad as long. The posterior pair of eyes on the crown, the anterior pair in the middle of the outer margin. The length of the palps, the tentacles, and the tentacular cirri is to that of the head about as $2^1/_2$ to 1; the antennæ half as long as the palps (Pl. III, fig. 16). The tentacles, the antennæ, and the tentacular cirri are, like the dorsal cirri, densely ciliated. The feet, divided into two bristle-bearing protuberances, about equal in length, with a short ventral cirrus (Pl. III, fig. 17). The dorsal bristles but little more than half as long as the ventral, a trifle thicker, and transversely serrulate. The ventral bristles with bipartite points, and much more coarsely serrate (Pl. III, fig. 18). The elytræ, to the naked eye, smooth, and studded with a number of dark minute oblong nodules along the posterior margin; the first pair round, the remaining pairs successively reniform, oblong, and — those farthest behind — ovate, with their longitudinal axis parallel to the line of the body. Under a magnifier, the whole surface of the scales, saving the anterior portion, is found to be studded with minute nodules, cleft at the points (Pl. III, figs. 19, 20). The large papillæ on the margin are claviform, and affixed to a soft stem (Pl. III, fig. 20). Both the outer and the posterior margin are furnished with cilia, the former densely, the latter sparingly. Scales brown; head colourless; appendages brown; back colourless.

Polynoe arctica, n. sp.
Stat. 223, 224, 237.

Kroppen temmelig bred, 36 Led, 15 Par Elytrer, der dække hele Ryggen. Hovedlappen (Tab. III, Fig. 1) noget længere end bred, udtrukket i to afstumpede Spidser. Tentakelbasis meget tyk; Tentakelen selv tynd, omtrent 3 Gange saa lang som Hovedet. Palperne af samme Længde, middels tykke, besatte med 6 Rader smaa Papiller. Antennerne omtrent halvt saa lange som Tentakelen. Tentakelcirrerne af samme Længde som Palperne. Disse ligesom Tentakelen og Antennerne med en liden spindelformig Opdrivning nedenfor Spidsen og med en brun Ring omkring samme, besatte med meget korte og ikke meget talrige Cilier. Dorsalcirrerne af samme Form, men med ulige talrigere og længere Cilier, række kun ubetydeligt udenfor Enden af Børsterne. Skællene (Tab. III, Fig. 2) langs ydre Rand tæt cilierede; Cilier findes ogsaa spredte langs bagre Rand og over den ydre Del af Fladen. Skællene forresten besatte med talrige, tætstaaende, smaa, runde og koniske, haarde Knuder over hele Fladen undtagen langs indre fordre Rand. Knuderne ere farveløse eller gult farvede, mod den bagre og ydre Rand blive de mere sparsomme, men større og mestendels brunt til sortfarvede, og ved den bagre Rand findes desuden 3—4 store, koniske, haarde Knuder, og langs den ydre cilierede Rand nogle større lysgule Knuder. Disse større Knuder have dels en glat, afrundet Spids, dels er denne spaltet i talrige mindre Knuder.

Fodknuderne (Tab. III, Fig. 3) ere delte i to temmelig jævnstore og spidse Børsteknuder; Ventralcirren rækker hen til Spidsen af Fodknuden; de dorsale Børster noget kortere og tykkere end de ventrale (Tab. III, Fig. 3), begge tværtandede, de ventrale med enkel Spids (Tab. III, Fig. 4 og 5).

Polynoe assimilis, n. sp.
Stat. 363.

Kroppen fladtrykt, 34 Led, 15 Par Elytrer. Hovedlappen fortil stærkt indskaaren, noget længere end bred (Tab. I, Fig. 22). Tentakelbasis temmelig tyk, Tentakelen selv tynd, omtrent 2 Gange saa lang som Hovedet; Palperne runde, glatte, lidt længere end Tentakelen. Tentakelcirrerne af Længde som Tentakelen. Antennerne halvt saa lange som denne. De tynde Tilhæng tæt cilierede. Elytrerne af vanlig Form, overalt besatte med smaa haarde

Polynoe arctica, n. sp.
Stats. 223, 224, 237.

The body comparatively broad; 36 segments. 15 pairs of elytræ covering the whole of the back. The lobe of the head (Pl. III, fig. 1), somewhat longer than broad, produced in two obtuse points. Base of tentacle exceedingly thick, the tentacle itself slender, about 3 times as long as the head. The palps of the same length, moderately thick, and furnished with 6 rows of minute papillæ. The antennæ about half as long as the tentacle. The tentacular cirri equal in length to the palps. The latter, as also the tentacle and the antennæ, which are furnished with exceedingly short and not very numerous cilia, have a small fusiform process, encircled by a brown ring projecting from below the point. The dorsal cirri, similar in form, but with longer and far greater numbers of cilia, project but very little beyond the extremities of the bristles. The scales (Pl. III, fig. 2) densely ciliated along the outer margin; cilia occur, too, sparingly dispersed, along the posterior margin, and over the outer portion of the surface. The scales covered, besides, over the whole surface, except along the inner anterior margin, with numbers of small, hard, closely set, round and conic, nodules. These nodules are either colourless or yellow; towards the outer posterior margin more sparingly distributed, but larger, and mostly brown or black; on the posterior margin occur, too, 3 or 4 large, conic, hard nodules, and along the outer ciliated margin a few more, light-yellow in colour and comparatively large. The latter have either a smooth, rounded or a cleft, bipartite point. Many smaller nodules.

The pedal protuberances (Pl. III, fig. 3) are divided into two acuminate bristle-bearing nodules; the ventral cirrus reaches to the summit of the ventral protuberances; the dorsal bristles somewhat shorter and thicker than the ventral (Pl. III, fig. 3); both transversely serrate, the ventral with simple points (Pl. III, figs. 4, 5).

Polynoe assimilis, n. sp.
Stat. 363.

Body depressed; 34 segments, 15 pairs of elytræ. The lobe of the head somewhat longer than broad; anteriorly, very emarginate (Pl. I, fig. 22). Base of tentacle comparatively thick; the tentacle itself slender, about twice the length of the head; the palps round, smooth, a trifle longer than the tentacle. The tentacular cirri of the same length as the tentacle; the antennæ half as long. The slender appendages densely ciliated. The elytræ of the usual

Knuder undtagen langs indre fordre Rand (Tab. I, Fig. 24). Knuderne (Tab. I, Fig. 25) tiltage i Størrelse mod den bagre og ydre Rand, og mod den bagre Rand findes to større halvkugleformige Knuder, der ere sammensatte af et stort Antal Smaaknuder. Tætte og lange Cilier langs ydre Rand, kortere saadanne langs den bagre Rand. Paa disse Skæl findes, ligesom hos *P. globifera* ved den ydre Rand et Parti, der er blødere end Resten af Skællet og derfor indsunket under dettes Niveau.

Fodknuderne med en meget kort dorsal Gren og en temmelig lang ventral Gren. Ventralcirren temmelig kort, række ei hen til Spidsen af Fodknuden (Tab. I, Fig. 23). De dorsale Børster noget kortere og tykkere end de ventrale; Børsterne forresten af den sædvanlige Bygning (Tab. I, Fig. 26).

form, everywhere studded, save along the inner anterior margin (Pl. I, fig. 24), with minute hard nodules. The nodules (Pl. I, fig. 25) increase in magnitude towards the posterior and outer margins; and at the posterior margin occur two comparatively large semi-globular protuberances, composed of numerous smaller ones. Long and closely set cilia on the outer margin; shorter cilia disposed along the whole of the posterior margin. On the scales, occurs at the outer margin, as in *P. globifera*, a section softer than the remaining part of the scale, and therefore sunk below the level of the surrounding surface.

The pedal protuberances with an exceedingly short dorsal and a comparatively long ventral branch. The ventral cirrus, comparatively short, does not reach to the extremity of the pedal protuberance (Pl. I, fig. 23). The dorsal bristles a trifle shorter and thicker than the ventral; both of the usual structure (Pl. I, fig. 26).

Polynoe spinulosa, n. sp.

Stat. 363.

Kroppen stor, flad, 7 Ctm. lang, 3 Ctm. bred med Børster, 36 Led, 15 Par Elytrer, der dække hele Ryggen. Hovedlappen liden, lidt længere end bred (Tab. I, Fig. 6). Tentakelen tynd, omtrent 4 Gange saa lang som Hovedet; Palperne runde, længere end Tentakelen; besatte med 6 Rader smaa Papiller, alene synlige under Mikroskopet. Antennerne halvt saa lange som Tentakelen. Tentakelcirrerne af samme Længde som Tentakelen. De tynde Tilhæng ligesom Dorsalcirrerne, der kun række ganske lidt udenfor Børsterne, tæt cilierede. Elytrerne af vanlig Form, tæt besatte med smaa, koniske, haarde Knuder, undtagen langs fordre indre Rand (Tab. I, Fig. 8). Mod den bagre Rand blive Knuderne større og for en stor Del sortfarvede, og ved den bagre Rand findes en Gruppe af 3 meget lange koniske Knuder med kløftede Spidser og mørke (Tab. I, Fig. 8 og 9). Langs ydre Rand 2 til 3 mindre saadanne og lyse (Fig. 8). Skællene ere langs ydre Rand tæt cilierede, og spredte Cilier findes langs bagre Rand.

Fodknuderne (Tab. I, Fig. 7) korte og tykke; den ventrale Gren tvert afskaaren og længere end den dorsale. De dorsale Børster noget kortere end de ventrale, der nedenfor den glatte, enkle, let krummede Spids ere meget

Polynoe spinulosa, n. sp.

Stat. 363.

Body large, flat, 7 cm long, 3 cm broad, with bristles; 36 segments, and 15 pairs of elytræ covering the whole of the back. The lobe of the head small, a trifle longer than broad (Pl. I, fig. 6); the tentacle slender, its length compared to the length of the head as 4 to 1; the palps round, longer than the tentacles, and furnished with 6 rows of minute papillæ, invisible to the naked eye. The antennæ half the length of the tentacle; the tentacular cirri of the same length as the tentacle. The slender appendages, as also the dorsal cirri, reaching but a very little beyond the points of the bristles, densely ciliated. The elytræ normal in form, thickly covered, except along the anterior inner margin, with small, hard, conical nodules (Pl. I, fig. 8). Towards the posterior margin, the nodules, mostly black, increase in magnitude, and on the posterior margin is seen a group of 3 exceedingly long, dark-coloured conical protuberances, cleft at the points (Pl. I, figs. 8, 9). Along the outer margin, occur 2 or 3 light-coloured smaller ones (fig. 8). The scales densely ciliated on the outer margin; the posterior margin likewise furnished with cilia, but sparingly.

The pedal protuberances short and thick (Pl. I, fig. 7), the ventral branch truncate, and longer than the dorsal. The dorsal bristles somewhat shorter than the ventral, which, below the smooth, simple, slightly arcuate points, are

grovere tvertandede end de dorsale; der ere meget fiut tvertandede (Tab. I. Fig. 10).

much more coarsely dentate than the dorsal, the latter being minutely serrulate (Pl. I, fig. 10).

Polynoe foraminifera, n. sp.

Stat. 338.

Kroppen ca. 6 Ctm. lang. Hovedet noget bredere end langt, ender fortil i to afrundede Prominentser (Tab. I, Fig. 11). Tentakelbasis meget lang, Tentakelen selv tynd, omtrent 4 Gange Hovedets Længde. Antennerne halvt saa lange som Tentakelen. Tentakelcirrerne af Tentakelens Længde; disse ligesom Tentakelen og Antennerne tæt cilierede. Palperne noget længere end Tentakelen, tykke, runde, med 6 Rader smaa Papiller. 15 Par Elytrer, der dække hele Ryggen. Skællene forsynede med en enkel lang, konisk, haard Knude ved den bagre Rand (Tab. I, Fig. 13) og forresten besatte med tætstaaende smaa haarde Knuder, der ere lyse, men mod den bagre Rand blive lidt større og sortfarvede. Cilier langs ydre Rand tætstaaende, sparsomme langs bagre Rand. Desuden paa alle Skæl flere Foraminiferer, der imponere som hvide, skinnende Knuder (Tab. I, Fig. 14).

Fodknuderne med to korte Lapper. Ventralcirren rækker ikke hen til Spidsen af Knuden (Tab. I. Fig. 12). Børsterne af vanlig Form, de dorsale kortere end de ventrale, der nedenfor den enkle krummede Spids ere grovere tvertandede end hine (Tab. I. Fig. 12, *a*).

Polynoe foraminifera, n. sp.

Stat. 338.

Body about 6^cm^ in length. Head somewhat broader than long, terminating anteriorly in two rounded prominences (Pl. I, fig. 11). Base of tentacle exceedingly long; the tentacle itself slender, about 4 times the length of the head; the antennæ half as long as the tentacle. The tentacular cirri of the same length as the tentacle, and both, together with the antennæ, closely ciliated. The palps, somewhat longer than the tentacle, thick, round, with 6 rows of minute papillæ; 15 pairs of elytræ, covering the whole of the back. The scales with a long, simple, conical, hard protuberance on the posterior margin (Pl. I, fig. 13), and studded besides with small, closely set nodules, light in colour, but changing to black and somewhat larger towards the posterior margin. The outer and the posterior margin furnished with cilia, the former densely, the latter sparingly. Moreover, on all the scales occur divers Foraminifera, having the appearance of white, lustrous granules (Pl. I, fig. 14).

The pedal protuberances with two short lobes; the ventral cirrus not reaching to the summit of the protuberance (Pl. I, fig. 12). The bristles normal in form, the dorsal shorter than the ventral, which, a little below the simple arcuate point, are much more coarsely transverse-serrate than the former (Pl. I, fig. 12, *a*).

Polynoe glaberrima, n. sp.

Stat. 366.

Dyret har megen Lighed med *Lænilla glabra*, Malmgren. Tentakelen mangler, Antennerne yderst korte. Palperne temmelig lange, ikke meget tykke og fuldstændigt glatte, ogsaa under Mikroskopet. Tentakelcirrerne lidt kortere end Palperne, sparsomt cilierede (Tab. III, Fig. 6). I dens Basalstykke findes ikke som hos *Lænilla glabra* to Børster, men derimod en Acicula (Tab. III, Fig. 9).

Skællene fuldstændigt glatte uden Spor af haarde Knuder (Tab. III, Fig. 7); langs ydre Rand nogle faa og tynde Cilier; enkelte ogsaa indover Fladen et Stykke (Tab. III, Fig. 8). Fodknudernes (Tab. III, Fig. 10) dorsale Gren forholdsvis temmelig stor og langt fremragende; Ven-

Polynoe glaberrima, n. sp.

Stat. 366.

This animal bears a close resemblance to *Lænilla glabra*, Malmgren. Tentacle wanting; antennæ exceedingly short. The palps comparatively long, not very thick, and — even under a lens — quite smooth. The tentacular cirri, sparingly ciliated, somewhat shorter than the palps (Pl. III, fig. 6). Their basal portion not furnished, as in *Lænilla glabra*, with two bristles, but with one acicula (Pl. III, fig. 9).

The scales completely smooth, without a trace of hard protuberances (Pl. III, fig. 7); along the outer margin some few delicate cilia, and also, a little inwards, on the surface (Pl. III, fig. 8). The dorsal branch of the pedal protuberances comparatively large, and much produced; the ventral

tralcirren naar ikke hen til Spidsen af den ventrale Gren. De dorsale Børster kortere og tykkere end de ventrale; hine fint og tæt tvertandede (Tab. III, Fig. 11, *a*); de ventrale med en lang sylformig Spids, og først temmelig langt nedenfor Spidsen begynde Takkerne, der ere temmelig lange og faa (Fig. 11, *b*, *c*).

cirrus not reaching to the extremity of the ventral branch. The dorsal bristles shorter and thicker than the ventral; the former minutely transverse-serrate (Pl. III, fig. 11, *a*); in the latter, the spikes, few in number and comparatively long (fig. 3, *b*, *c*), commence some distance below the long, styliform point.

Nemidia Torelli (?), Mgrn.

Stat. 374.

Det er kun med Usikkerhed, at jeg henfører 2 Brudstykker af en Polynoe til denne af Malmgren opstillede Form.

Det ene Exemplar var 2 Ctm. langt og 0.8 Ctm. bredt med Børster, havde 20 Segmenter og 2 Elytrer, 1 af 1ste og 1 af 2det Par paa den ene Side. Hovedlappen noget længere end bred, ender i to spidst uddragne Prominentser (Tab. III, Fig. 12) uden tydelige Øine. Tentakelen tynd, omtrent 3 Gange saa lang som Hovedet. Palperne glatte, middels tykke, noget længere end Tentakelen; Tentakelcirrerne glatte, af Tentakelens Længde. Antennerne ere meget korte, 1/4 af Hovedets Længde. Elytrerne glatte uden Spor af haarde Knuder eller Cilier. Dorsalcirrerne række til Spidsen af Børsterne, glatte. Fodknuderne delte i to meget spidse Grene (Tab. III, Fig. 13); de dorsale Børster faa i Antal og meget kortere end de ventrale. Begge Sorter yderst tynde og med sylformige Spidser (Tab. III, Fig. 14, *a* Dorsal, *b* Ventral).

Det andet Exemplar havde ogsaa 20 Segmenter, men er 3 Ctm. langt og 1.5 Ctm. bredt med Børster. 1ste Par Skæl sidder fast og der medfølger flere affaldne Elytrer. Børsterne ere meget tykkere end hos hine, især de dorsale, der som vanligt have en afrundet Spids, men udmærke sig ved sin yderst fine Tvertanding, ligesom hos det andet Exemplar. De ventrale Børster af aldeles samme Bygning som hos det andet Exemplar med en lang sylformig Spids (Tab. III, Fig. 15). Øinene ere hos dette Exemplar lidt mere fremtrædende end hos det andet. Elytrerne ere farveløse, enkelte af de større med nogle brunlige Flekker og langs ydre Rand samt paa den ydre Del af Fladen med et ringe Antal yderst korte Cilier.

Nemidia Torelli (?), Mgrn.

Stat. 374.

It is with considerable hesitation that I refer two fragments of a *Polynoe* to this form, established by Malmgren.

One of the mutilated specimens, measuring 2^{cm} in length and 0.8^{cm} in breadth, including the bristles, was furnished with 20 segments and 2 elytræ on either side, 1 belonging to the 1st and 1 to the 2nd pair. The lobe of the head, somewhat longer than broad, terminating in 2 acuminate prominences (Pl. III, fig. 12); eyes not distinctly obvious. Tentacle slender, about thrice the length of the head. The palps smooth and moderately thick, somewhat longer than the tentacle; the tentacular cirri, of the same length as the tentacle, smooth. The antennæ exceedingly short, their length being to the length of the head as 1 to 4. The elytræ smooth, without a trace of hard knotty protuberances, or of cilia. The dorsal cirri, reaching to the points of the bristles, smooth. The pedal protuberances bearing two exceedingly acuminate branches (Pl. III, fig. 13); the dorsal bristles much shorter than the ventral, and few in number; both exceedingly slender, and with styliform points (Pl. III, fig. 14; *a* dorsal, *b* ventral).

The other specimen, too, had 20 segments, but did not measure more than 3^{cm} in length and 1.5^{cm} in breadth, with the bristles. The first pair of scales was still *in situ*, and there were several detached elytræ. The bristles much thicker than in the first specimen, particularly the dorsal, which have, as usual, a rounded point, but are distinguished, like those in the first specimen, by their exceedingly minute transverse serration. The ventral bristles, of precisely the same structure as those in the first specimen, have a long styliform point (Pl. III, fig. 15). The eyes in this example a trifle more conspicuous than in the other. The elytræ are mostly colourless; some of the larger ones, however, exhibit a few brownish spots; and along the outer margin, as also over the outer portion of the surface, occur a limited number of exceedingly short cilia.

Phyllodoce arctica, n. sp.

Stat. 321.

Hovedlappen, med hjerteformig Basis, lidt bredere end lang (Tab. III, Fig. 21). Den udkrængede Proboscis cylindrisk, paa den bagre Del forsynet med 12 Rader smaa Papiller, 6 paa hver Side, med omtrent 15 Papiller i hver Rad. Den forreste Del noget tykkere end den bagre, forsynet med Tverrynker. Fodknudernes øvre Blad afrundet firkantet (Tab. III, Fig. 22); det nedre Blad aflangt til spidst, rækker lidt udenfor Enden af Børsteknuderne. Børsterne sammensatte, Endeledet svagt bøiet og langs den konkave Rand fint tandet (Tab. III, Fig. 23). Dyret har mest Lighed med *Ph. mucosa*, fra hvilken det hovedsageligst skiller sig ved Antallet af Papiller paa Snabelen.

Nephthys atlantica, n. sp.

Stat. 18, 31, 87.

Et lidet Stykke fra hver Station, det længste 5 Ctm. langt. Hos det ene Exemplar er Snabelen delvis udstrakt og den udkrængede Del er tæt besat med Papiller i Længderader; den nærmest Hovedet liggende Del er glat. Ved at klippe op Snabelen sees den besat med Papiller lige til Mundingen, om hvilken der findes en Krands af større Papiller. Branchier findes kun paa 13de til 35te Led, mangler baade foran og bag disse Led (Tab. IV, Fig. 1, 2).

Typhlonereis gracilis, n. g. & n. sp.

Stat. 40.

To Førender, den længste 4 Ctm. lang og 2 mm bred.

Legemet fortil lidt smalere end bagenfor. Hovedet meget længere end bredt (Tab. IV, Fig. 15), to Tentakler, halvt saa lange som Hovedet; Palperne store med halvkugleformigt Endeled. Tentakelcirrerne korte, kun lidt længere end Hovedet. Ingen Øine. De fire første børste-ærende Segmenter have kun et Børstebundt og mangle rsal- og Ventralcirre (Tab. IV, Fig. 17); de følgende have 2 Børstebundter samt begge Cirrer (Tab. IV, 6). I hvert Børstebundt en tynd, kort Acicula, i ndt kun faa Børster, i nedre to separate Bundter.

Phyllodoce arctica, n. sp.

Stat. 321.

The lobe of the head, a trifle broader than long, with cordiform base (Pl. III, fig. 21). The evaginated proboscis cylindrical, furnished along its posterior portion with 12 rows of small papillæ (about 15 papillæ in each row), 6 on either side. The anterior portion, somewhat thicker than the posterior, transverse rugose. The pedal protuberances have the upper lamella convexo-quadrangular (Pl. III, fig. 22); the lower lamella, ovato-acuminate, reaches a little beyond the extremity of the bristle-bearing protuberance. The bristles compound, slightly curved, and finely serrate along the concave margin (Pl. III, fig. 23). This animal bears closest resemblance to *Ph. mucosa*, from which it is distinguished chiefly by the number of papillæ on the proboscis.

Nephthys atlantica, n. sp.

Stats. 18, 31, 87.

A small fragment from each Station, the largest measuring 5 cm. In one of the mutilated specimens, the proboscis is partially exserted, and the evaginated portion appears densely studded with papillæ, arranged in longitudinal series; the part nearest the head is smooth. On opening the proboscis, the papillæ may be traced to the oral aperture, which is encircled by a cincture of larger papillæ. Branchiæ occur from the 13th to the 35th segment, but are wanting on the others (Pl. IV, figs. 1, 2).

Typhlonereis gracilis, n. g., n. sp.

Stat. 40.

Two anterior portions, the largest measuring 4 cm in length and 2 mm in breadth.

The body a trifle more attenuate anteriorly than posteriorly. The head much longer than broad (Pl. IV, fig. 15); two tentacles half the length of the head; the palps large, with semi-orbicular terminal articulations. The tentacular cirri short, but very little longer than the head. No eyes. The four first bristle-bearing segments have each a fascicle of b[...]tles, but neither dorsal nor ventral cirri (Pl. IV, fi[...] 17); [...]les of the succeeding segments are furnished with two [...] 16). bristles, and have both dorsal and ventral cirri (Pl [...] In each fascicle is seen a slender, short [...] supe-

I det øverste Bundt samme Sort Børster som de dorsale, sammensatte med en temmelig lang, lige og tynd Spids (Tab. IV, Fig. 19, *a*); i nedre Bundt ogsaa sammensatte Børster, men med en kortere og tykkere samt svagt krummet Spids (Fig. 19, *b*). Kjæverne temmelig stærkt krummede med en lang Spids og langs indre Rand forsynede med 10 afstumpede Tænder (Tab. IV, Fig. 18). Mangelen paa Øine ligesom de manglende dorsale Børsteknuder i de 4 forreste Fodknuder have bevæget mig til at opføre dette Dyr som Repræsentant for en ny Slægt.

Onuphis hyperborea, n. sp.

Stat. 18, 48.

Flere Exemplarer i sine Rør, der ere flade og besatte med Smaasten, 5 til 6 Ctm. lange. Dyrene rage med Forenden ud af Rørene. Det længste Exemplar paa 58 Led 5 Ctm. langt med en største Bredde af 0.5 Ctm.

Legemet er langstrakt, smalere fortil, tiltager jævnt i Bredde indtil det 15de Led, holder sig dernæst af jævn Bredde til henimod Bagenden, hvor det atter afsmalner. Hovedlappen temmelig stærkt hvælvet; Antennerne korte, aflange, Palperne tykkere og længere, under Hovedet (Tab. IV, Fig. 5 og 6). Tentaklerne med korte tværrynkede Basalled, meget lange; den midtre naar tilbagebøiet til bagre Rand af 5te Segment; de to derpaa følgende ere omtrent dobbelt saa lange; de to forreste og yderste igjen kortere end den midtre. To Øine, et paa hver Side, udad og bagtil for det længste Par Tentakler. Første Segment, omtrent dobbelt saa bredt som langt, bærer paa hver Side en kort Følercirre, er uden Fødder. 2det Segment ogsaa dobbelt saa bredt som langt, de følgende Segmenter tiltage i Bredde og aftage i Længde. De to første Par Fødder større end de følgende, forsynede med Dorsal- og Ventralcirre og i Spidsen med to cirreformige Vedhæng (Læbier), et øvre kortere og tykkere og et nedre længere og tyndere (Tab. IV, Fig. 10, 11). I disse to Knuder findes kun aciculære Børster, todelte i Spidsen, med en lang krum Yderrand og en liden Antydning til en Tand nedenfor denne (Fig. 10). Børsterne række kun med sine Spidser ud mellem de to cirreformige Vedhæng. 3die til 10de Fodknude med noget længere Dorsalcirre, men uden Ventralcirre, istedetfor hvilken der optræder en halvkugleformig Knud[illegible] [illegible]d Basis af Fodknuden (Tab. IV, Fig. 12). Der findes [illegible] Spidsen to cirreformige Vedhæng, det nedre længe[illegible] [illegible] øvre, længst paa 3die Segment. Børsterne,

rior fascicle consisting of but few bristles, the inferior of two separate fascicles. The bristles in the superior fascicle similar to the compound dorsal bristles, and terminating in a comparatively long, straight, and slender point (Pl. IV, fig. 19, *a*); the inferior fascicle likewise consisting of compound bristles, which have however a shorter, thicker, and slightly arcuate point (fig. 19, *b*). The jaws a good deal curved, with an elongated point, and furnished along the inner margin with 10 obtuse teeth (Pl. IV, fig. 18). As both the eyes and the fascicles of dorsal bristles in the 4 anterior pedal protuberances are wanting in this form, I have thought proper to constitute a new genus for its reception.

Onuphis hyperborea, n. sp.

Stats. 18, 48.

Several specimens in their tubes (5^{cm} or 6^{cm} in length), which are flat and studded with minute pebbles. The anterior portion of the animal projects out of the tube. The largest example, with 58 segments, measured 5^{cm} in length and 0.5^{cm} in breadth.

Body elongate, anterior extremity narrow; the breadth, however, gradually increases up to the 15th segment, from thence continuing uniform almost to the posterior extremity, where it again diminishes.

The lobe of the head arcuate; the antennæ short, oblong; the palps thicker and shorter under the head (Pl. IV, figs. 5, 6). The tentacles exceedingly long, with short, transversely corrugated basal articulations; the medial tentacle reaches, when bent back, to the posterior margin of the 5th segment; the two succeeding tentacles are about twice as long, and the outermost anterior pair shorter than the medial tentacle. Two eyes, one on either side, without and posterior to the longest pair of tentacles. The first segment, without feet, about as broad as long, having on either side a short cirrhiferous feeler; the second segment likewise as broad as long, whereas the remaining segments increase in breadth and diminish in length. The two first pairs of parapodia larger than the rest, furnished with dorsal and ventral cirri, and bearing at the extremity two cirrhiferous appendages (labiæ), one above, short and thick, and one below, long and slender (Pl. IV, figs. 10, 11). These two protuberances are only furnished with acicular bristles, cleft at the points, with a long, curved outer tooth and a little below it a dental rudiment (fig. 10). T[illegible] points of the bristles reach only between the cirrhife[illegible] appendages. The pedal protuberances, from the 3[illegible] the 10th inclusive, with somewhat longer dorsal ci[illegible] no ventral cirri, in place of which occurs a semi[illegible]

der kun rage ubetydeligt frem, ere 3 Slags: aciculøse Børster af samme Form som i to forreste Led, men med en meget kortere ydre Tand og med Spidsen ligesom dækket af en Hætte; haarformige, svagt gule Børster med en lang bredbræmmet Spids, der staar lidt skraat mod Stilken, og endelig meget tynde, farveløse Børster, der i Enden ere udbredte til en vifteformig, fint stribet (foldet?) Membran (Fig. 12). At disse Børster ikke ere infundibuliforme, som Malmgren kalder dem, men meiselformige, som de betegnes af Ehlers, sees let, naar man faar dem halvt i Profil. Paa 11te Fod, der forresten er udstyret som de foran liggende, findes indenfor Dorsalcirren en kort Branchie (Tab. IV, Fig. 13). Dorsalcirrerne blive bagover mindre og mindre, indtil de ganske forsvinde ved det 21de Led; Branchier findes mindst til det 8de Led bagfra, kanske endnu længere. Fodknuderne forresten uforandrede, kun aftagende i Størrelse lige til Analleddet, der er forsynet med to meget lange Analcirrer (Tab. IV, Fig. 9). Farven: Hovedets Forende blaagrøn, 1ste Led brunt, de følgende Led med en, jo længere bag, desto smalere brun Bræm langs fordre Rand; de bagerste Led farveløse; her skinner Tarmen igjennem.

Denne Onuphis har mest Lighed med *O. conchylega*, M. Sars, hvis Rør ikke altid er dækket med Conchyliefragmenter, men oftere findes dækket med Smaasten som hos den her beskrevne Art. Rørene have hos begge Arter den samme fladtrykt firkantede Form. *O. conchylega* har derimod i 2det Par Fodknuder 3 Slags Børster, denne Art kun aciculøse. Kjæverne ere ens af Bygning, men Tænderne have hos *O. conchylega* 9 Takker, hos denne Art kun 8 (Tab. IV, Fig. 7), og Tænderne ere hos *O. conchylega* i det hele lysere, kun langs de takkede Render mørktfarvede, skjønt der i denne Henseende findes mange Modifikationer.

Glycera capitata, Ørst.

Af Exemplarer indfangede i Saltstrømmen havde et en tvedelt Bagende med Forlængelse af Tarmkanalen ud i begge Grene (Tab. V, Fig. 27).

prominence at the base of the pedal protuberance (Pl. IV, fig. 12). At the summit are seen two cirrhiferous appendages, the lower longer than the upper, and longest on the 3rd segment. The bristles — but slightly projecting — are of three kinds, viz.: — 1) acicular bristles, similar to those on the two anterior segments but with a much shorter outer tooth, and having the point, as it were, covered with a mantlet; 2) capilliform, pale yellow bristles, with an elongate, broad-bordered point, inclining towards the pedicle; and 3) exceedingly delicate, colourless bristles, spreading out at the extremity into a finely striate (folded?) flabelliform membrane (fig. 12). That these bristles are not, as termed by Malmgren, infundibuliform, but, as Ehlers calls them, chisel-shaped, is seen at a glance when regarding them obliquely. The 11th foot, in other respects precisely similar to those preceding it, bears, inside the dorsal cirrus, a short branchia (Pl. IV, fig. 13). Posteriorly, the dorsal cirri become smaller and smaller, till, at the 21st segment, they disappear altogether. Branchiæ occur at least, counting backwards, to the 8th segment, possibly still farther. The pedal protuberances, continuing in other respects uniform, diminish gradually in magnitude out to the anal orifice, which has two exceedingly long anal cirri (Pl. IV, fig. 9). Colour: — The anterior extremity of the head bluish-green; 1st segment brown; the following segments distinguished by a brown edge along the anterior margin, becoming narrower at each successive segment; the posterior segments colourless. Here the intestine shines through the skin.

This Onuphis bears most resemblance to *O. conchylega*, M. Sars, in which the tube is not always covered with conchilious fragments, but frequently with minute pebbles, as is the case with the species here described. In both species the tubes have the same depressed, quadrangular form. *O. conchylega* is, on the other hand, distinguished by three kinds of bristles on the 2nd pair of pedal protuberances; this species has only one — the acicular. The maxillæ are in both species similar as to structure; but the teeth in *O. conchylega* have 9 jags, in this species only 8 (Pl. IV, fig. 7); moreover, the teeth in *O. conchylega* are lighter in colour, being dark only along the jagged margins, though in this respect numerous modifications are observed.

Glycera capitata, Ørst.

Among the specimens of this form brought up at Saltstrømmen, one had the posterior extremity bipartite, with the intestinal canal produced into both branches. (Pl. V, fig. 27).

Aricia arctica, n. sp.

Stat. 224. Jan Mayen, 10—15 Favne.

To Exemplarer ca. 3 Ctm. lange og 1—1½mm brede. Bagenden mangler hos begge. Kropsformen (Tab. V, Fig. 20 & 25) den samme som hos *A. Cuvieri* og *norvegica,* Forkroppen dog stærkere fladtrykt. Hovedet konisk tilspidset uden Tilhæng og Øine; Mundsegmentet halvt saa langt som Hovedet, men dobbelt saa bredt som dette. Forkroppens dorsale Børstebundter (Tab. V, Fig. 21) sidde paa Randen mellem Ryg og Sideflader, og ere forsynede med en yderst kort Cirre eller Labie; de ventrale Børster sidde i lange Rader paa Kroppens Sidedel (Tab. V, Fig. 21, 25); Fodknuden er ikke som hos de to andre Arter forsynet med et tandet Blad. I begge Børstebundter tynde, ringede Haarbørster og i den ventrale Knude desuden et større Antal kortere og tykkere Børster mellem hine, af en ganske anden Form end hos begge de andre Arter, med en afrundet, bøiet Spids og nedenfor denne svagt sagtandede langs den ene Rand (Tab. V, Fig. 26). Branchierne begynde som yderst smaa Fremragninger først paa det 12te Segment (Fig. 20) og tiltage bagover i Størrelse, indtil de paa det 17de Segment naa sin fulde Størrelse som tilspidsede Blade, der sidde temmelig nær Midtlinien paa den her flade Ryg. Fra dette Segment faa ogsaa Fodknuderne en anden Form (Tab. V, Fig. 22) og Stilling, idet den dorsale nu sidder et Stykke inde paa Ryggen og har et Labium, der kun er lidet kortere end Branchien, og den ventrale Knude sidder paa Randen mellem Ryg og Sideflade og er forsynet med et Læbeblad, der sidder udad og nedad for Knuden. I begge Knuder findes fra nu af kun tynde, ringede Haarbørster, i den ventrale kun et ringe Antal. Af Billeder, jeg flere Gange har seet, fremgaar det, at de som ringede udseende Børster i Virkeligheden kun ere sagtakkede paa den ene Side og, naar denne Side vender til Beskueren, se ud som ringede (Tab. V, Fig. 23, 24).

Aricia arctica, n. sp.

Stat. 224. Jan Mayen 10—15 fathoms.

Two specimens, 3cm long and 1—1½mm broad; the posterior extremity wanting in both. The form of the body (Pl. V, figs. 20, 25) the same as in *A. Cuvieri* and *A. norvegica;* but the anterior portion more depressed. The head acuminate, without either appendages or eyes; the oral segment half the length of the head and double its breadth. The dorsal fascicle of bristles (Pl. V, fig. 21) disposed along the margin between the dorsal and lateral surfaces, and furnished with an exceedingly short cirrus, or labium; the ventral bristles arranged in long rows on the lateral portion of the body (Pl. V, figs. 21, 25); the pedal protuberances not provided as in the other two species with a dentate lamella. In both fascicles of bristles slender annulated capillary bristles; and in the ventral protuberance, besides, a considerable number of shorter and thicker bristles, dispersed between the latter and of a totally different form from that in both the other species, — having an arcuate point, and, a little below it, one of the margins slightly dentate (Pl. V, fig. 26). The branchiæ, commencing on the 12th segment (fig. 20) as minute projections, increase in magnitude posteriorly, the largest, occurring as acuminate lamellæ in comparatively close proximity to the mesial line of the flat dorsal surface, being those on the 17th segment. From this segment, too, the pedal protuberances are characterized by a different form (Pl. V, fig. 22) and position: the dorsal protuberance, which has a labium but little shorter than the branchia, placed on the back a little inwards; and the ventral protuberance, with a labiate lamella beyond and below it, occurring on the margin between the dorsal and lateral surfaces. From here, in both protuberances, exclusively slender, annulated, capilliform bristles. Judging from several representations I have seen, these "annulated" bristles are serrate, but on one side only, which, when that side is turned towards the observer, gives them an annulated appearance (Pl. V, figs. 23, 24).

Scalibregma (?) abyssorum, n. sp.

Stat. 18.

Kun Forenden, 8mm lang og 1mm bred, noget afsmalnende fortil, med udkrænget Snabel (Tab. V, Fig. 1 og 2). Hovedet er en firkantet Lap, bredere fortil end bagtil, uden Øine og uden Tentakler (Tab. V, Fig. 3). Mundsegmentet børsteløst, de fire følgende Led med to vifteformige Bundter meget tynde Haarbørster paa hver Side. Paa 3die til 5te Led sidder der paa hver Side bag det dorsale Børstebundt en Branchie, den paa 4de Led størst,

Scalibregma (?) abyssorum, n. sp.

Stat. 18.

The anterior extremity only, measuring 8mm in length and 1mm in breadth, a trifle narrower anteriorly; proboscis exserted (Pl. V, figs. 1, 2). The head constituting a quad[rangular] lobe, broader anteriorly than posteriorly, with[out] either eyes or tentacles (Pl. V, fig. 3). Bristles wan[ting] on the oral segment, the four succeeding segments two flabelliform fascicles of exceedingly thin capilla[ry bristles] on either side. The 3rd, 4th, and 5th seg[ments]

der fra en temmelig tyk Stilk løber ud i talrige smaa Endegrene (Pl. V, Fig. 4). Disse 5 Led ere ganske glatte uden nogen Fure mellem Leddene paa Rygfladen. De bagenforliggende Led ere hvert ved dybe Furer delt i fire Ringe og paa den bagerste af disse Ringe sidde paa hver Side to Børstebundter i to smaa koniske Knuder (T. V, Fig. 5). Børsterne ere Haarbørster som i de forreste Led, men kortere og færre end paa disse; desuden findes i det ventrale Børstebundt paa alle Led et Antal kortere gaffelformede Børster, der sidde i en egen Sæk, med to lidt udadbøiede Tænder (T. V, Fig. 6). Den udkrængede Snabel er foldet, men glat, uden Tænder (Fig. 2).

Scalibregma (?) parvum, n. sp.

Stat. 18, 31.

Af dette Dyr var der et Exemplar fra Stat. 18, der var iturevet paa Midten, og fra Stat. 31 fire Exemplarer, af hvilke de 3 vare hele og havde en Længde af 12^{mm} og en Bredde af 1^{mm}.

Kroppen er pølseformig (T. V, Fig. 12); hos et Exemplar Forenden noget opdrevet (T. V, Fig. 11).

Hovedlappen firkantet, bredere fortil end bagtil; de to forreste Hjørner udtrukne i en kort Papille, ved Basis en Grube paa hver Side, i hvilken der sidder en liden rund Papille (T. V, Fig. 8). 1ste Led børsteløst, i de følgende Led sidde paa hver Side to vifteformige Børstebundter i smaa mamilla-artige Knuder (T. V, Fig. 13), der efterhaanden blive større bagover, indtil der fra det 12te børstebærende Segment optræder ordentlige Fodknuder, der ere delte i en dorsal og en ventral Gren, der hver have en spidst fremragende Del, af hvilke Børsterne komme frem, og, den dorsale opad, den ventrale nedad, indenfor Spidsen et lidt fremragende Blad, der er størst paa den dorsale Gren (T. V, Fig. 14). Leddene ere paa Forkroppen ved dybe Furer mere eller mindre fuldstændigt afdelte i to Ringe; paa Bagkroppen ere Leddene delte i 3 Ringe. Furerne paa og mellem Leddene blive paa Bagenden utydelige; denne smalner jævnt af og ender med et lidt opdrevet Analled, Anus terminal (T. V, Fig. 10); Forknuderne aftage i Størrelse paa de 4—5 sidste Led og Børsterne blive kortere.

Paa et Exemplar var Snabelen udkrænget og stod som en kugleformig Blære frem under Hovedet, fuldkommen

furnished on either side, posterior to the dorsal fascicle of bristles, with a branchia, which from a thickish stem sends off numerous terminal branchlets, that on the 4th being the largest (Pl. V, fig. 4). The five anterior segments quite smooth on the dorsal surface, without a trace of intervening grooves or furrows. The posterior segments are each deeply sulcated, constituting four ring-shaped sections, the posterior of which is furnished on either side with two fascicles of bristles composing two small conical protuberances (Pl. V, fig. 5). These bristles are capilliform, as in the anterior segments, but shorter and less numerous; moreover, the ventral fascicle has on all the segments a number of comparatively short, furcate bristles, in a peculiar sac, each with two teeth bent slightly outwards (Pl. V, fig. 6). The evaginated proboscis folded, but quite smooth, without a trace of teeth (fig. 2).

Scalibregma (?) parvum, n. sp.

Stats. 18, 31.

A specimen of this animal, mutilated in the middle, came up at Station 18, and 4 specimens, 3 of them perfect, measuring 12^{mm} in length and 1^{mm} in breadth, were obtained at Station 31.

Body cylindrical (Pl. V, fig. 12); in one of the specimens the anterior extremity was somewhat tumid (Pl. V, fig. 11).

The lobe of the head quadrangular, broader anteriorly than posteriorly; the two anterior angles produced, forming a wart-like prominence, with foveæ at the base, one on either side, in which is seen a small round papilla (Pl. V, fig. 8). Bristles wanting on the first segment; the succeeding segments furnished on either side with two flabelliform fascicles of bristles, placed in small mammillary protuberances (Pl. V, fig. 13), which, posteriorly, continue to increase in magnitude till, from the 12th bristle-bearing segment, they form true pedal protuberances, with a dorsal and a ventral branch, each having a pointed protrusive portion, from which the bristles on the dorsal branch project upwards, on the ventral, downwards; a little below the point is seen a slightly projecting lamella, largest on the dorsal branch (Pl. V, fig. 14). On the anterior portion of the body, the segments are more or less bisulcated, forming each two ring-shaped sections; on the posterior portion, the segments constitute three sectional rings. The furrows on and between the segments indistinct at the posterior extremity, which gradually narrows, terminating in a somewhat tumescent anal segment (anus terminal) (Pl. V, fig. 10); the last four or five pedal protuberances diminish in magnitude, the bristles, too, becoming shorter.

In one of the specimens the proboscis was evaginated, and had the appearance of a globular vesicle protruding

glat uden Tænder (T. V, Fig. 9). Børsterne ere som hos den foregaaende Art ens i alle Led, nemlig lange og tynde glatte Haarbørster (T. V, Fig. 17) og desuden i hver af de ventrale Knuder et Bundt gaffelformede Børster (T. V, Fig. 15, *a*), af samme Form, men noget større end de tilsvarende hos foregaaende Art (T. V, Fig. 16).

Gaffelformede Børster omtales af Malmgren som forekommende hos *Eumenia crassa*. De findes ikke alene hos denne, men ogsaa hos *Scalibregma inflatum*. De hos *Eumenia* forekommende ere dog meget tykkere og have længere, i Spidsen stærkt udadbøiede Tænder, og dertil er den ene Tand fint sagtandet et Stykke langs den indre Rand ved Basis (T. V, Fig. 18). Hos *Scalibregma inflatum* ere de tyndere og Tænderne ikke saa lange, samt glatte (T. V, Fig. 19). Hos begge disse Dyr sidde disse Børster i et eget Bundt og kun den gaffelformige Spids rager udenfor Fodknuden.

Alene Forekomsten af denne eiendommelige Børsteform hos de to beskrevne Dyr vilde være nok til at vise, at de henhørte til *Scalibregmidæ*. Kropsformen hos begge Arter stemmer mest med den hos *Scalibregma* og fornemmelig Hovedlappens Form og hos den sidste tillige Forknudernes paa Bagkroppen; den mangler rigtignok Branchier, men da vi vide, at disse ogsaa mangle hos unge Individer af *Eumenia crassa*, saa tør vel det samme kunne være Tilfældet hos unge Exemplarer af *Scalibregma*. Og for den første Arts vedkommende tør det vel være, at de manglende Fodknuder har fundets paa den manglende Del af Dyret; her fandtes kun 13 Led og hos den anden optraadte Fodknuderne første paa 12te børsteførende Segment.

Ammotrypane cylindricaudatus, n. sp.

Stat. 31, 87.

2 Exemplarer, 5 ctm. lange og 1mm brede (T. VI, Fig. 20). Hovedlappen spids med to Gruber paa Overfladen, mellem hvilke Huden rager frem som en Køl (T. VI, Fig. 21). Mundaabningen paa Underfladen. Ved første Børstebundt ingen Branchie; derimod findes en Branchie paa hver Side af de følgende 6 Led; paa de derpaa følgende 20 Led mangle Branchier, men optræde igjen paa de 3 næstsidste Led foran den eiendommelige Bagende (T. VI, Fig. 22). Kropsformen foran denne er den samme som hos *Ammotrypane aulogaster* med 2 Valker langs Bugfladen og Børster og Branchier siddende i den dybe Fure mellem Valkene og Kropsvæggen (T. VI, Fig. 24). Efter det sidste Børstebundt i denne Fure følge 4 Led med ordentlige Fodknuder (T. VI, Fig. 22) der ere forsynede med 2 Børstebundter. Fodknuderne danne som en Fortsættelse

from beneath the head; it was quite smooth, without teeth (Pl. V, fig. 9). As in the foregoing species, the bristles are uniform on all the segments, viz. long, slender, smooth, and capilliform (Pl. V, fig. 17); each of the ventral protuberances having besides a fascicle of furcate bristles (Pl. V, fig. 15, *a*), similar in form, but somewhat larger than those corresponding with them in the foregoing species (Pl. V, fig. 16).

Furcate bristles occur, according to Malmgren, in *Eumenia crassa*. They are met with not only in this animal but also in *Scalibregma inflatum*. Those in *Eumenia* are, however, considerably thicker, and have longer teeth, curving outwards; moreover, one of the teeth is finely dentate along part of the inner margin at the base (Pl. V, fig. 18). In *Scalibregma inflatum* they are more slender; the teeth, too, are smooth, and not so long (Pl. V, fig. 19). In both animals these bristles are arranged in a separate fascicle, the furcate point only projecting beyond the pedal protuberance.

The occurrence of this peculiar form of bristles in the two animals described, is in itself sufficient to show their relationship with the *Scalibregmidæ*. The form of the body in both species bears the closest resemblance to that distinguishing *Scalibregma*, more especially as regards the lobe of the head and the posterior pedal protuberances; true, branchiæ are wanting, but, since these organs do not occur either in young specimens of *Eumenia crassa*, the same may be the case with young individuals of *Scalibregma*. And as regards the first species, the pedal protuberances, absent in the defective specimen, possibly did occur on the missing part of the animal; at least, I counted only 13 segments, and in the other species the pedal protuberances do not commence till on the 12th bristle-bearing segment.

Ammotrypane cylindricaudatus, n. sp.

Stats. 31, 87.

Two specimens, measuring each 5cm in length and 1mm in breadth (Pl. VI, fig. 20). The lobe of the head pointed, with two foveæ on the surface, between which the skin presses up like a keel (Pl. VI, fig. 21). The buccal aperture on the under surface. No branchia at the first fascicle of bristles, but the 6 following segments with a branchia on either side; branchiæ wanting on the 20 succeeding segments, but again present on each of the 3 immediately preceding the peculiar posterior extremity (Pl. VI, fig. 22). The form of the body anterior to the latter the same as in *Ammotrypane aulogaster*, with two longitudinal prominences along the ventral surface, branchiæ and fascicles of bristles occupying the deep furrow extending between the prominences and the wall of the body (Pl. VI, [illegible]). The terminal fascicle in the said furrow is succeeded by 4 segments,

af Bugvalkene og deres Børster ere meget talrige (T. VI, Fig. 26), kortere og tykkere (Fig. 27) end de paa den øvrige Del af Kroppen (Fig. 25) og tillige let bruntfarvede, medens disse ere farvelose. Bag disse fire Led kommer et 3—4mm langt, glat Rør, som mod Enden er lidt opdrevet paa Dorsalsiden og her ender med en liden Tap, der hænger udover den kortere, brede Underlæbe for Analaabningen (T. VI, Fig. 22). Rørets Overflade er tværfuret over Rygfladen og begge Sideflader; paa Bugfladen derimod findes der to longitudinale Folder som Fortsættelse af Bugvalkene (T. VI, Fig. 23). Ved at komprimere denne Del og undersøge den under Mikroskopet sees den at være beklædt af en Chitinhud, der gaar i et med Kroppens; den er desuden forsynet med et Lag Ring- og et Lag Længdemuskler og inde i Røret kan Tarmkanalen skimtes. Hos det ene Exemplar manglede dette Rør (T. VI, Fig. 28).

Hvad enten nu dette er en udkrængbar Analtrakt, der kan trækkes ind i Kroppen eller den altid er ude, saa er den tilligemed de 4 fodknudebærende Led saa mærkelig, at Dyret kanske rigtigst burde henføres til en ny Slægt; men da det forresten viser saa stor Overensstemmelse med *Ammotrypane aulogaster*, har jeg foretrukket at henføre det til samme Slægt.

with true pedal protuberances (Pl. VI, fig. 22), bearing two fascicles of bristles. The pedal protuberances may be regarded as a continuation of the ventral prominences; their bristles are exceedingly numerous (Pl. VI, fig. 26), shorter and thicker (fig. 27) than those occurring elsewhere on the body (fig. 25), and of a lightish brown, whereas the latter are colourless. Posterior to these 4 segments is seen a smooth lobe, 3mm—4mm long, somewhat raised at the extremity on the dorsal side, and terminating there in a slender spigot-shaped projection reaching out over the broad and comparatively short nether lappet of the anal opening (Pl. VI, fig. 22). The lobe is transversely striated both on the dorsal and the lateral surfaces, whereas on the ventral surface occur two longitudinal folds, protending from the ventral prominences (Pl. VI, Fig. 23). On compressing this tube and examining it under the microscope, it is found to be invested with a chitinous integument coalescing with that of the body; moreover, it has a layer of annular and a layer of longitudinal muscles, and within the tube can be discerned the intestinal canal. In one of the specimens the tube was wanting (Pl. VI, fig. 28).

Now, whether this tube be an exserted anal tract admitting of being invaginated into the body, or whether it be non-retractile, it certainly constitutes, along with the 4 pedal protuberances, so remarkable a character, that a new genus should, perhaps, be established for the reception of the animal; but, possessing as it does, so much in common with *Ammotrypane aulogaster*, I have nevertheless referred it to the same genus.

Sphærodorum abyssorum, n. sp.

Stat. 33.

Et mindre vel bevaret Exemplar, ca. 1 ctm. langt, tilspidset i begge Ender (T. VI, Fig. 16). Chitinhuden er løsnet over hele Bagenden, og ogsaa hist og her ellers. Dyret har mest Lighed med *Ephesia gracilis*. Det har som denne smaa klare Papiller paa Ryg- og Bugfladen; flere saadanne findes ogsaa paa hver af de kugleformige Rygcirrer (T. VI, Fig. 18), der ere fyldte med Celler, fuldkomment afgrændsede fra det øvrige Hypoderm, men hvis nærmere Anordning paa Grund af Præparatets Tilstand ei kan udredes. Ogsaa paa Enden af Fodknuderne findes Papiller, og disses Børster række noget længere frem end hos *Ephesia gracilis*; der er som hos denne en Acicula i hvert Børstebundt. De 4—5 andre Børster ere sammensatte; paa den bredere skraat afskaarne Ende sidder en liden tynd, krummet Spids (T. VI, Fig. 19). Lignende Børster findes hos den af Graff i Ann. & Mag. of Natural History Vol. XX beskrevne *Sphærodorum Claparedi*.

Sphærodorum abyssorum, n. sp.

Stat. 33.

A somewhat mutilated specimen, 1cm in length, with acuminate extremities (Pl. VI, fig. 16). The chitinous integument was detached over the whole of the posterior part, and here and there also in other places. This animal bears most resemblance to *Ephesia gracilis*, and is, in common with that form, furnished with small, transparent papillæ on the dorsal and ventral surfaces; several papillæ of the same kind occur, too, on each of the globular dorsal cirri (Pl. VI, fig. 18), which are composed of cells, perfectly distinct from those in the remaining portion of the matrix; their arrangement could not, however, be distinguished owing to the bad state of the specimen. Papillæ also occur at the extremity of the pedal protuberances, whose bristles reach a trifle farther out than do those in *Ephesia gracilis*; as in that form, each fascicle is furnished with an acicula. The remaining bristles (4 or 5) compound; at the broad, obliquely truncate extremity is seen a small, slender, arcuate point (Pl. VI, fig. 19). Similar bristles occur, according to Graff (Ann. & Mag. of Natural History, Vol. XX), in *Sphærodorum Claparedi*.

Trophonia hirsuta, n. sp.

Stat. 18, 31.

3 ufuldstændige Exemplarer, det længste vel 1 ctm. langt med 21 Led.

Kroppen aflang, tilspidset fortil med 8—10 lange fortil rettede Børster paa hver Side af 1ste Segment (T. VII, Fig. 5). Huden besat med lange tynde Villi, der ere længst omkring Børsterne og paa Ryggen, kortest paa Bugfladen (T. VII, Fig. 6); paa Villi ligger et tyndt brunligt Slamlag (T. VII, Fig. 8, *a*).

De dorsale Børster ere rette, lange, de ventrale kortere, brune med opadbøiede Spidser (Fig. 6). Begge Sorter ere leddede, de tykkere ventrale (T. VII, Fig. 8) med længere og tydeligere fremtrædende Led end de dorsale (T. VII, Fig. 7). I den indtrukne Siphon ligge to korte, brede, bladformige Tentakler og bag dem 8 sylformige Branchier.

Trophonia borealis, n. sp.

Stat. 270, 275.

3 ctm. lang, afrundet for begge Ender; fortil lange fremadrettede Børster, der have Dyrets halve Længde (T. VII, Fig. 13); bagenfor dem 17 Led. Hele Overfladen fint grynet; de dorsale Børster temlig lange og let synlige, de ventrale korte, kun at opdage under Lupen. Farven brunlig, skyldes et Overtræk af Slam imprægneret med Sand og Smaasten; naar dette afskrabes er Huden farveløs og besat med Villi jævntæt paa Ryg og Bug. I øvre Børstebundt 12—14 lange tynde Haarbørster, der ere leddede (T. VII, Fig. 14, 15). I nedre Bundt 5—6 korte, svagt Sformigt krummede, tykke Børster, der nedenfor den glatte Spids have tynde Tværstriber og en skraat gaaende Længdestribning (T. VII, Fig. 14, 16).

Trophonia rugosa, n. sp.

Magdalenabay, 30—50 F.

3½ ctm. lang, 7mm tyk, afsmalnende mod den bagre Ende (T. VII, Fig. 9). Huden paa Rygfladen tværrynket, paa Bugfladen med smaa Gryn. Paa 1ste Segment fortil

Trophonia hirsuta, n. sp.

Stats. 18, 31.

Three imperfect specimens, the largest, with 21 segments, measuring 1cm in length.

Body oblong, acuminate anteriorly, with from 8 to 10 long bristles, directed forwards, on either side of the 1st segment (Pl. VII, fig. 5). The skin furnished with long slender villi, those round the bristles and on the back longest, those on the ventral surface shortest (Pl. VII, fig. 6); over the villi extends a thin layer of brownish mud (Pl. VII, fig. 8, *a*).

The dorsal bristles are long and straight, the ventral shorter, with brown points, curving upwards (fig. 6). Both articulated, and comparatively thick (Pl. VII, fig. 8), having the segments longer and more distinctly prominent than have the dorsal ones (Pl. VII, fig. 7). Within the retracted siphon occur two short, broad, petaloid tentacula, posterior to which are seen 8 styliform branchiæ.

Trophonia borealis, n. sp.

Stats. 270, 275.

Length 3cm, rounded at both extremities. Anteriorly long bristles, directed forwards, half the length of the animal, (Pl. VII, fig. 13); posterior to them, 17 segments. The whole surface minutely granulated. The dorsal bristles comparatively long, and distinctly perceptible; the ventral short, and invisible to the naked eye. Colour brownish, derived from a thin covering of mud, mixed with sand and minute pebbles; on scraping away this deposit, the skin is found to be colourless, and covered with villi uniform in height alike on the back and the belly. In the upper fascicle from 12 to 14 long, slender, articulated capillary bristles (Pl. VII, figs. 14, 15); in the lower fascicle, 5 or 6 short, thick, slightly arcuate bristles, in shape presenting some resemblance to the letter S, and, a little below the smooth point, finely striate, with transverse and obliquely longitudinal striæ (Pl. VII, figs. 14, 16).

Trophonia rugosa, n. sp.

Magdalena Bay, 30—50 fms.

Length 3½cm, thickness 7mm, tapering towards the posterior extremity (Pl. VII, fig. 9). The skin on the dorsal surface transversely rugose, on the ventral surface

rettede Børster af ringe Længde (T. VII, Fig. 9). Bagenfor 25 Led. Paa disse Led findes en ventral Børsteknude, medens de dorsale Børster ingen Knude have. Disse sidste 4—5 i hvert Bundt, ere tynde og leddede (T. VII, Fig. 10, 11); de ventrale, 5—6 i hvert Bundt ere tykke, brune med en smal lang farveløs Spids og nedenfor denne temlig tæt tværstribede (T. VII, Fig. 10, 12).

finely granulated. On the first segment, bristles of trifling length, directed forwards (Pl. VII, fig. 19). Posterior to the former, 25 segments, with a ventral, bristle-bearing protuberance; the dorsal bristles, which have no protuberance, slender and articulated (Pl. VII, figs. 10, 11), 4 or 5 in each fascicle; the ventral, 5 or 6 in each fascicle, thick, and brown in colour, with a rather long, colourless point, below which they are striated transversely (Pl. VII, figs. 10, 12).

Trophonia arctica, n. sp.

Magdalenabay, 20 F.

2 ctm. lang, 4mm bred med afrundet Forende og afsmalnende mod Bagenden (T. VII, Fig. 17). 21 børstebærende Segmenter. Rygfladen jævnt smaagrynet, Bugfladen med færre og mindre Papiller. De to forreste Leds Børster rettede fremad, kun temlig korte, af samme Bygning som de dorsale Børster bagenfor, lange, tynde, leddede (T. VII, Fig. 19), de ventrale Børster 4—5 i en liden Knude (T. VII, Fig. 18) betydeligt tykkere, med en lang klar Spids og nedenfor denne temlig fint tværstribede (T. VII, Fig. 20).

Trophonia arctica, n. sp.

Magdalena Bay, 20 fms.

Length 2cm, breadth 4mm, with the anterior extremity rounded, and tapering posteriorly (Pl. VII, fig. 17); 21 bristle-bearing segments. The dorsal surface uniformly granulated; the papillæ on the ventral surface fewer and smaller. The bristles on the two foremost articulations directed forwards, comparatively short, but similar in structure to the posterior dorsal bristles, which are long, slender, and articulated (Pl. VII, fig. 19); the ventral bristles, 4 or 5 arranged in a small protuberance (Pl. VII, fig. 18), considerably thicker, with a long transparent point, below which they are finely and transversely striate (Pl. VII, fig. 20).

Brada granulosa, n. sp.

Stat. 337.

Det længste Exemplar 5 ctm. langt $1^1/_2$ ctm. bredt. Pølseformig, tilspidset i begge Ender (T. VII, fig. 21). Kroppen overalt besat med Villi, der ere længere paa Ryg- end paa Bugfladen; denne plan, hin hvælvet. Over Villi et Slimoverdrag med Smaasten. Børsterne 6—8 i hvert Bundt, temlig tykke, tværstribede og med en krummet klar Spids (T. VII, fig. 22). Ingen dorsale Børster kunne opdages.

Brada granulosa, n. sp.

Stat. 337.

The largest specimen measuring 5cm in length and $1^1/_2$cm in breadth. Body cylindrical, pointed at the extremities (Pl. VII, fig. 21), and everywhere studded with villi, those on the dorsal surface (convex) longer than those on the ventral (plane). Over the villi extends a thin covering of mud interspersed with pebbles. The bristles, from 6 to 8 in each fascicle, thickish, transversely striate, and with a bent, transparent point (Pl. VII, fig. 22). No dorsal bristles could be detected.

Cirratulus abyssorum, n. sp.

Stat. 87.

3 Exemplarer, alle ufuldstændige, uden Bagende. Det mindste Exemplar har ingen Branchier; af de to andre har det største foruden paa forreste Led ogsaa enkelte Branchier fasthængende paa de bagenforliggende Led, saa langt som til 30te Led. Hovedlappen konisk; ingen børsteløse Segmenter bag samme (T. VII, Fig. 33). Leddene ere meget smale og bære paa hver Side 2 Bundter temlig lange og meget tynde Haarbørster, der sidde i to meget smaa Knuder (T. VII, Fig. 34). Farven er ved den gjennemskinnende Tarmkanal grønlig; Huden selv er farveløs.

Cirratulus (?) abranchiatus, n. sp.

Stat. 31.

3 Exemplarer, 14^{mm} lang, 3^{mm} bred. Kroppen aflang, tilspidset i begge Ender, sammensat af smale Led med lange, tynde Børster (T. VII, Fig. 1). Hovedet en liden afstumpet Kegle uden Tilhæng og Øine; bag dette et bredt og 2 smale børsteløse Segmenter, der sammen med Hovedet danne en konisk Fremragning paa de bagenfor liggende bredere, børsteførende Segmenter (T. VII, Fig. 2). Munden paa Undersiden af Hovedet. Hvert børsteførende Segment bærer paa hver Side en langagtig Fremragning med en liden Mamille paa den øvre og nedre Ende, i hvilke sidde de to Bundter meget lange og tynde, fuldkomment glatte Kapillærbørster (T. VII, Fig. 4). Der er intet særligt afgrændset Svælg; Tarmen gaar lige gjennem Kroppen, fastheftet med tynde Dissepimenter. Blodkar kunde ei opdages, heller ikke Segmental-Organer.

Trods den fuldstændinge Mangel paa de for *Cirratuliderne* karakteristiske Branchier, synes dette Dyr dog ved sin Bygning forresten at staa denne Slægt nærmest.

Clymene Koreni, n. sp.

Stat. 87.

1 Exemplar, vel 2 ctm. langt og 1^{mm} tykt, 18 børstebærende Segmenter, ingen nøgne anteanale Segmenter. Hovedet hvælvet, med en smal paa begge Sider indskaaret

Cirratulus abyssorum, n. sp.

Stat. 87.

Three defective specimens, the posterior extremity gone in each. The smallest specimen has no branchiæ; in the largest of the two other examples, a few branchiæ are still attached to the segments, as far as the 30th segment. The lobe of the head conical; no naked segments behind it (Pl. VII, fig. 33). The segments exceedingly slender, bearing on either side 2 fascicles of comparatively long and exceedingly delicate capilliform bristles, arranged in two very small protuberances (Pl. VII, fig. 34). Colour greenish white, the intestinal canal shining through the skin; the skin itself is colourless.

Cirratulus (?) abranchiatus, n. sp.

Stat. 31.

Three specimens, measuring 14^{mm} in length and 3^{mm} in breadth. Body, oblong and pointed at the extremities, built up of slender segments, bearing long, delicate bristles (Pl. VII, fig. 1). The head a small obtuse cone, without either eyes or appendages; posterior to the head, 1 broad and 2 narrow, naked segments, which, along with the head, constitute an acuminate projection on the posterior broader bristle-bearing segments (Pl. VII, fig. 2). The buccal aperture on under surface of head. Each bristle-bearing segment having on either side an elongate projection, furnished with a small mammilliform tubercle both at the upper and the lower extremity, in which are seen the two fascicles of exceedingly long, slender, and perfectly smooth capillary bristles (Pl. VII, fig. 4). There is no separate pharynx; the intestine passes straight through the body, to which it is attached by slender membranous filaments. No blood-vessels were detected, or segmental organs.

Of the branchiæ distinguishing this genus, there is indeed not a trace in the animal here described; but its general structure nevertheless brings it nearest to the *Cirratulidæ*.

Clymene Koreni, n. sp.

Stat. 87.

One specimen, a trifle over 2^{cm} in length and 1^{mm} in thickness. Furnished with 18 bristle-bearing segments; no naked pre-anal segments. Head convex, with a narrow

Bræm (T. VI, Fig. 2). Analleddet tragtformigt uden Cilier i Randen (T. VI, Fig. 3); Anus i Bunden af Tragten. Haarbørsterne ere temmelig lange, lidt udvidede og smalt bræmmede ved Begyndelsen af den lange Spids (T. VI, Fig. 5). 1ste børstebærende Segment uden Hagebørster, af hvilke der findes 4 paa det følgende Led og temmelig talrige paa alle de følgende Led. Hagebørsterne have et Rostrum med 3 Tagger og et kort Haarbundt nedenfor samme (T. VI, Fig. 4).

emarginate border on either side (Pl. VI, fig. 2). The anal articulation funnel-shaped, without cilia along the margin (Pl. VI, fig. 3); the anus at the bottom of the funnel-shaped segment. The capilliform setæ comparatively long, a trifle enlarged, dilated, and with a narrow border at the commencement of the point (Pl. VI, fig. 5). The first setigerous segment without ungueal setæ, of which there are 4 on the following articulation and a good many comparatively on the others. The uncini furnished with a tridentate rostrum, below which occurs a capillary fascicle (Pl. VI, fig. 4).

Myriochele Sarsii, n. sp.

Stat. 38, 40, 51, 164, 183.

Dyrene ligge indesluttede i Rør af $2^1/_2$ til 3 Ctm. Længde og 1.5mm Bredde. Rørene ere tæt besatte med Biloculiner, tilsyneladende noget forskellige, idet somme ere tyndere og ikke besatte saa tæt med Biloculiner som Resten; men de indeslutte samme Dyr.

Kroppen er 22mm lang og $^1/_2$mm tyk, rund (T. VI, Fig. 6). Hovedlappen er ægformig med Mundaabningen paa Undersiden, uden Tilhæng og Øine (T. VI, Fig. 8). Bag Hovedet komme 3 korte Led, der alene have Haarbørster; de følgende Led have foruden Haarbørstebundter ogsaa Hagebørster i lange Tori paa Ventralfladen, de forreste Led noget kortere, de midterste de længste, mod Bagenden igjen kortere, og de sidste 10 Led yderligt korte; Analleddet noget opdrevet og teml. langt, *anus terminal* (T. VI, Fig. 9). De dorsalt stillede Haarbørster have ingen Fodknude og danne to Bundter (T. VI, Fig. 10); det øvre bestaar af lange, tynde, fuldkomment glatte Haarbørster (T. VI, Fig. 7, *a*), det nedre af glatte, men kortere, lidt bredere og svagt krummede Børster (Fig. 7, *b*). Hagebørsterne sidde i lange Tori, der ere noget hævede over Kroppens Niveau; Børsterne have i Spidsen to fortil krummede spidse Hager paa et øvre svagt S-krummet Stykke, der sidder fast paa en tynd, i den øvre Ende lidt opdreven Stilk (T. VI, Fig. 12). Børsterne sidde 4—5 jævnsides i Tori (T. VI, Fig. 11). Tarmen gaar lige gennem Kroppen, er beklædt med Cylinderceller fyldte med grønne Korn. I hvert af de lange Segmenter findes der paa hver Side en lang Sæk, der indvendigt er beklædt med Flimmerceller med meget lange Flimmerhaar, og som synes at udmunde mellem de dorsale Haarbørster og Tori. Jeg har ei været istand til at opdage nogen indvendig Aabning paa dem; men de maa dog vel antages at være Segmentalorganer. Ingen Blodkar kunde opdages.

Myriochele Sarsii, n. sp.

Stats. 38, 40, 51, 164, 183.

These animals inhabit tubiform buildings, from $2^1/_2$cm to 3cm in length and 1.5mm in breadth. The tubes, which are densely studded with *biloculinæ*, would appear to vary in form and appearance, some being narrower and less closely covered with *biloculinæ* than others.

Body cylindrical, measuring 22mm in length and $^1/_2$mm in thickness (Pl. VI, fig. 6). The lobe of the head ovate, with the buccal aperture on the under surface, without either eyes or appendages (Pl. VI, fig. 8). Posterior to the head are seen 3 short segments, furnished only with capillary setæ; the succeeding segments have, besides capillary setæ, also ungueal setæ, arranged in long rows on the ventral surface. The anterior segments somewhat shorter than the others, the medial longest, those near the posterior extremity diminishing in length, and the 10 terminal segments exceedingly short; the anal segment somewhat enlarged, and rather long (Pl. VI, fig. 9), the anal opening at its extremity. The dorsally placed capillary setæ have no pedal protuberance; they constitute two fascicles (Pl. VI, fig. 10), the upper fascicle composed of long, slender, perfectly smooth capillary setæ (Pl. VI, fig. 7, *a*), the lower of smooth, but shorter, a trifle broader, and slightly curved setæ (fig. 7, *b*). The uncini arranged in long rows, slightly projecting above the surface of the body; these setæ have at the extremity two sharp, anteriorly curved hooks, issuing from a lamella, resembling above the letter S, attached to a slender stem (Pl. VI, fig. 12) slightly enlarged at the upper extremity. The uncini are arranged in rows, 4 or 5 side by side (Pl. VI, fig. 11). The intestine, passing straight through the body, is furnished with cylindrical cells, full of green granules. Each of the long segments has, on either side, an elongate sac, having a layer of cells, with exceedingly long, vibratile cilia, and apparently disemboguing between the dorsal capillary setæ and the row of uncini. I failed indeed to detect any opening on its inner end; but it probably must be regarded as the segmental organ. No trace of blood-vessels.

Denne Annelide har stor Lighed med *Myriochele Heeri*, Mgrn.; den er dog betydeligt tyndere end denne og har ei som denne fine Tagger henimod Spidsen af Haarbørsterne. Malmgrens Tegning af Hagebørsterne mangler ogsaa den Fortykkelse i Enden af Stilken, der bærer den øvre Ende, som findes hos det ovenfor beskrevne Dyrs Hagebørster. Jeg har derfor troet at burde opføre den som en ny Art af den samme Slægt.

This Annelid bears great resemblance to *Myriochele Heeri*, Mgrn., though the body is considerably narrower, and the capilliform setæ not, as in that form, finely toothed towards the points. Moreover, Malmgren's drawing of the ungueal setæ in *M. Heeri* shows no trace of the inspissation at the end of the stem distinguished in the uncini of the animal described above; and hence I have established it as a new species of the same genus.

Myriochele Danielsseni, n. sp.

Stat. 192.

Rørene vel $^{1}/_{2}{}^{mm}$ tykke, bestaa af Slam, besat med Smaasten og lange Kiselnaale som af en Svamp (T. VI, Fig. 15). Intet Dyr kunde faaes helt ud; paa et saaes en afrundet Ende og bag denne 3 Segmenter med Kapillærbørster alene (T. VI, Fig. 13); dette har formodentlig været en Forende, skønt Mundens Beliggenhed ei kunde opdages. Paa alle de følgende Led ogsaa Hagebørster, der sidde 8—10 jævnsides i Tori; disse ere meget lange og naa næsten sammen paa Bugfladen. Hagebørsterne have to Tagger i Spidsen (T. VI, Fig. 14), og denne er svagt krummet som hos *M. Sarsii;* men Børsterne vare ikke sammensatte som hos denne. Ligesom hos *M. Sarsii* findes der i hvert af de længere Segmenter to Sække, der synes at udmunde mellem Torus og Kapillærbørstebundtet (T. VI, Fig. 13, *a*).

Myriochele Danielsseni, n. sp.

Stat. 192.

The tubes, $^{1}/_{2}{}^{mm}$ in thickness, consist of hard mud, studded with minute pebbles and long siliceous needles, apparently sponge-needles (Pl. VI, fig. 15). None of the specimens could be got out of the tubes entire; one had a rounded extremity, posterior to which were 3 segments with setæ, all capilliform (Pl. VI, fig. 13); this was probably the anterior part of the animal, though I failed to find any trace of a buccal aperture. The following segments had all of them ungueal setæ, arranged side by side, 8 or 10 together; the tori are exceedingly long, reaching almost on to the ventral surface. The uncini furnished with 2 jags at the point (Pl. VI, fig. 14), which is slightly curved, as in *M. Sarsii;* the setæ are not compound. As in *M. Sarsii*, each of the longer segments has 2 internal sacs, apparently disemboguing between the torus and the fascicle of capilliform setæ (Pl. VI, fig. 13, *a*).

Patamilla Malmgreni, n. sp.

Stat. 40, 51.

Længden vel 3 Ctm., deraf Branchierne 1 Ctm., Bredden vel 1^{mm}.

Legemet rundt, Bagkroppen lidt fladtrykt, ender spidst, Anus terminal (T. VII, Fig. 23). Bugfuren kun synlig paa Bagkroppen. Kraven nedbøiet i hele Sidepartiet med fortil og bagtil opretstaaende Flige, mellem hvilke der findes temmelig dybe Indsnit. Paa 1ste Segment kun kapillære Børster, paa de 7 følgende ogsaa Hagebørster ventralt stillede. De kapillære Børster 2 Slags: lange, tynde med en smalt bræmmet Spids (T. VII, Fig. 25) og korte subspathulerede (T. VII, Fig. 24), ligeligt bredt bræmmede nedenfor den korte Spids. Hagebørsterne biseriale, forreste Rad med en lang, tynd Spids paa en lang krummet Stilk (T. VII, Fig. 26, *a*) anden Rad aviculære, ligeledes siddende paa en lang Stilk (Fig. 26, *b*).

Patamilla Malmgreni, n. sp.

Stats. 40, 51.

Length a fraction over 3^{cm} — including the branchiæ 1^{cm}; breadth slightly exceeding 1^{mm}.

Body round; posterior portion somewhat depressed, with a pointed extremity; anus terminal (Pl. VII, fig. 23). The ventral furrow can be distinguished only on the posterior portion of the body. The collar curving downwards in the lateral region; anteriorly and posteriorly with erected lobules, between which are seen comparatively deep incisions. On the 1st segment none but capillary setæ; on the succeeding segments also ungueal setæ, ventrally situated. Two kinds of capillary setæ, the one long and slender with a narrow bordered extremity (Pl. VII, fig. 25), and the other short, subspatulate, uniformly broad-bordered, and belted below the short pointed extremity. The ungueal setæ biserial, those in the first

Paa Bagkroppen findes i Bugknuden 2 Slags Haarbørster, lange, tynde og kortere, tykkere med smalt bræmmet Spids. Hagebørsterne uniseriale, aviculære (T. VII, Fig. 27). Branchierne 10—12 paa hver Side med lange Radioler lige til Spidsen.

series having a long slender point protending from a long arcuate stem (Pl. VII, fig. 26, *a*); those in the second, which are avicular, likewise issuing from a long stem (fig. 26, *b*). On the posterior portion of the body, 2 kinds of capillary setæ in the ventral protuberance, the one long and slender, the other comparatively short and thick, with broad-belted points. The uncini uniserial, avicular (Pl. VII, fig. 27). From 10 to 12 branchiæ on either side, with long radiolæ from the base to the point of the upper extremity.

Protula arctica, n. sp.

Stat. 51.

To Exemplarer, fra Stat. 40 to tomme Rør. Rørene ere hvide, af Kalk, forsynede med mere og mindre tydeligt fremtrædende Tværstriber (T. VII, Fig. 28). Dyret uden Branchier 1.5 Ctm. langt, Branchierne 1 Ctm. lange; Tykkelsen ca. 1mm. Kroppen er rund, lidt fladtrykt, Forkroppen bestaar af 7 Segmenter; Kraven opret med et dybt Indsnit fortil og et paa hver Side (T. VII, Fig. 29), aaben bagtil, hvor den paa begge Sider gaar over i Brystmembranen, hvis tvende Bræmme ligge over hinanden og dække hele Rygfladen af Forkroppen. Paa Siderne skinner den skældannende Kjertel gennem Huden. Paa første Segment findes almindelige Haarbørster med en lang, krummet Spids og nedenfor denne en kort, temmelig bred, tandet Bræm (T. VII, Fig. 31). Paa de 6 følgende Led findes ogsaa Hagebørstetori. De kapillære Børster ere talrige i hvert Led og korte, nedenfor den lange Spids forsynede med en temmelig lang, smal, fint tandet Bræm (T. VII, Fig. 32). Hagebørsterne have 6 Tænder, af hvilke den nederste er dobbelt saa tyk som de øvrige (T. VII, Fig. 30). Bagkroppens samtlige Led ere forsynede med dorsalt stillede Hagebørster og ventrale Haarborstebundter. Hagebørsterne have samme Form som de paa Forkroppen, men ere kun omtrent halvt saa store som disse. Haarbørsterne ere fuldkommen glatte (T. VII, Fig. 33) og paa den forreste Del temmelig korte, paa de sidste ca. 30 Led derimod meget lange. Branchierne ere besatte med temmelig lange Radioler, have en kort nøgen Spids, nedenfor hvilken de første Radioler ere korte, tiltagende i Længde nedover. Branchierne, 18—20 paa hver Side, sidde paa et Blad, der hæver sig frit op fortil med en Begyndelse til Spiraldreining.

Protula arctica, n. sp.

Stat. 51.

Two specimens; from Station 40 two empty tubes. The tubes, more or less distinctly marked with transverse striæ, white, consisting of calcareous deposit (Pl. VII, fig. 28). Length 1.5cm without the branchiæ, which are 1cm long; thickness about 1mm. Body round, slightly compressed; the anterior portion consisting of 7 segments; the collar erect, with a deep incision anteriorly, one on either side (Pl. VII, fig. 29); open posteriorly, where it coalesces on both sides with the thoracic membrane, the two folds of which lie one upon the other, covering the whole surface of the back on the anterior portion of the body. On the sides, the shell-producing gland is seen shining through the integument. The 1st segment has only the usual capilliform setæ with long arcuate points, below which is seen a short, comparatively broad dentated border (Pl. VII, fig. 31). On the 6 following segments also uncini. The capilliform setæ, numerous on each segment, are short, and have below the elongate point a comparatively long, narrow, finely toothed border (Pl. VII, fig. 32). The ungueal setæ with 6 teeth, the lowermost twice as thick as the others (Pl. VII, fig. 30). The segments on the posterior portion of the body all furnished with ungueal setæ, dorsally situated, and with fascicles of ventral capilliform setæ. The ungueal setæ are similar in form to those on the anterior part of the body, but not more than about half as long. The capilliform setæ perfectly smooth (Pl. VII, fig. 33), and on the anterior part of the body comparatively short; but on the terminal segments — about 30 — they are, on the other hand, exceedingly long. The branchiæ, studded with comparatively long radiolæ, have a short, naked point; the first radiolæ, a little below the point, are short, the remainder increasing in length downwards. The branchiæ, from 18 to 20 on either side, attached to a free lamella, rise anteriorly, commencing with a spiral twist.

Spinther arcticus, M. Sars.

Stat. 275.

Det indfangede Exemplar var usædvanligt stort. Sars angiver Længden til 8^{mm} og Bredden til 4^{mm}, medens dette Exemplar, stærkt sammentrukket i Alcohol, maalte 15^{mm} i Længden og 8^{mm} i Bredden. Da der ingen Tegninger findes af dette Dyr, leverer jeg saadanne paa T. I, Fig. 1 til 5. Efter Sars's Beskrivelse ere Bøsterne forsynede *apice furcata seu bicuspide;* dette er ikke Tilfældet hos det paa Stat. 275 indfangede Exemplar; hos dette have Børsterne en enkel, hist og her lidt krummet Spids (T. I, Fig. 5).

Jeg meddeler hernæst den ovenfor nævnte Fortegnelse over de i den kolde Area fundne Annelider, ordnede efter de Familier de tilhøre.

Spinther arcticus, M. Sars.

Stat. 275.

The specimen obtained was unusually large. Sars states the length of his Norwegian specimens to have been 8^{mm} and the breadth 4^{mm}; but this specimen, though much shrunk from the action of the alcohol in which it was preserved, measured 15^{mm} in length and 8^{mm} in breadth. The animal not having previously been figured, representations are given here, in Pl. I, figs. 1—5. According to Sars, the setæ are furnished *apice furcata seu bicuspide;* this, however, is not the case with the specimen brought up at Station 275, its setæ having a simple, straight, and here and there very slightly arcuate point (Pl. I, fig. 5).

I will now annex a List of the Annelids collected in the Cold Area, arranged under the families to which they belong.

1876.	1877.	1878.
	Euphrosynidæ.	
		Spinther arcticus, M. Sars. Stat. 278 (—0°.4).
	Amphinomidæ.	
Paramphinome pulchella, M. Sars. Stat. 18 (—1°.0) 33(—1°.1) 87(—1°.1).		
	Polynoidæ.	
Polynoe globifera, G. O. Sars. Stat. 18(—1°.0) 31(—1°.0) 48(—0°.5). *Polynoe islandica,* n. sp. Stat. 48 (—0°.5). *Polynoe aspera,* n. sp. Stat. 48 (—0°.5). *Polynoe Sarsii,* Knbg. Stat. 31 (—1°.0), 33 (—1°.1), 35 (—0°.8). *Polynoe villosa,* Mgrn. Stat. 31 (—1°.0).	*Polynoe globifera,* G. O. Sars. Stat. 124 (—0°.9) 164 (—0°.7) 192 (—0°.7). *Polynoe arctica,* n. sp. Stat. 223 (—0°.0) 224 (—0°.6).	*Polynoe globifera,* G. O. Sars. Stat. 293 (—1°.3). *Polynoe glaberrima,* n. sp. Stat. 366. *Polynoe foraminifera,* n. sp. Stat. 275 (—0°.7), 338 (—1°.0).
	Acoetidæ.	
	Sigalionidæ.	
	Nephthydidæ.	
Nephthys atlantica, n. sp. Stat. 18(—1°.0), 31(—1°.0) 87(—1°.1).	*Nephthys Malmgreni,* Théel. Stat. 124 (—0°.9).	*Nephthys ciliata,* Müller. Stat. 267 (—1°.4), 338 (—1°.1), 366 (—0°.2). *Nephthys Malmgreni,* Théel. Stat. 312 (—1°.2).

1876.	1877.	1878.
	Phyllodocidæ.	
	Nereidæ.	
Typhlonereis gracilis, n. sp. Stat. 40 (—1°.2).		*Nereis zonata*, Mgrn. Stat. 366 (—2°.1).
	Lumbrinereidæ.	
Lumbrinereis fragilis, Müller. Stat. 18 (—1°.0), 31 (—1°.0), 40 (—1°.2), 48 (—0°.5).	*Lumbrinereis fragilis*, Müller. Stat. 223 (—0°.0), 224 (—0°.6), 225 (—0°.6), 248 (—1°.4).	*Lumbrinereis fragilis*, Müller. Stat. 267 (—1°.4), 275 (—0°.4), 366 (—0°.2).
	Onuphididæ.	
Onuphis hyperborea, n. sp. Stat. 18 (—1°.0), 48 (—0°.5).	*Onuphis conchylega*, M. Sars. Stat. 124 (—0°.9), 164 (—0°.7), 192 (—0°.7), 223 (—0°.0), 225 (—0°.6), 251 (—1°.3).	*Onuphis conchylega*, M. Sars. Stat. 267 (—1°.4).
	Glyceridæ.	
	Glycera capitata, Ørsted. Stat. 164 (—0°.7), 192 (—0°.7).	
	Ariciidæ.	
Scoloplos armiger, Müller. Stat. 18 (—1°.0).	*Aricia arctica*, n. sp. Stat. 224 (—0°.6).	
	Scalibregmidæ.	
Scalibregma inflatum, Rathke. Stat. 18 (—1°.0). *Scalibregma abyssorum*, n. sp. Stat. 18 (—1°.0). *Scalibregma parvum*, n. sp. Stat. 18 (—1°.0), 31 (—1°.0).		
	Ophelidæ.	
Ammotrypane cylindricaudatus, n. sp. Stat. 31 (—1°.0), 87 (—1°.1).		
	Sphærodoridæ.	
Ephesia gracilis, Rathke. Stat. 31 (—1°.0). *Sphærodorum abyssorum*, n. sp. Stat. 33 (—1°.1).	*Ephesia gracilis*, Rathke. Stat. 164 (—0°.7).	
	Chloræmidæ.	
Trophonia hirsuta, n. sp. Stat. 8 (—1°.0), 31 (—1°.0).	*Trophonia glauca*, Mgrn. Stat. 124 (—0°.9).	*Flabelligera affinis*, M. Sars. Stat. 366 (—2°.1). *Trophonia arctica*, n. sp. Magdalenbay, 20 f. *Brada granulosa*, n. sp. Stat. 275 (—0°.4), 338 (—1°.1), 366 (—2°.1).

1876.	1877.	1878.
		Brada inhabilis, Rathke. Stat. 366 (—2°.1, 0°.2). *Brada granulata,* Mgrn. Stat. 275 (—0°.4), 338 (—1°.1).
	Cirratulidæ.	
Cirratulus abyssorum, n. sp. Stat. 87 (—1°.1). *Cirratulus abranchiatus,* n. sp. Stat. 31 (—1°.0).		
	Maldanidæ.	
Clymene Koreni, n. sp. Stat. 87 (—1°.1).		
	Ammocharidæ.	
Myriochele Sarsii, n. sp. Stat. 40 (—1°.2), 51 (—1°.1).	*Ammochares assimilis,* M. Sars. Stat. 224 (—0°.6). *Myriochele Sarsii,* n. sp. Stat. 164 (—0°.7). *Myriochele Danielsseni,* n. sp. Stat. 192 (—0°.7).	*Myriochele Sarsii,* n. sp. Stat. 295 (—1°.3).
	Ampharetidæ.	
Amphicteis Gunneri, M. Sars. Stat. 31 (—1°.0). *Samytha sexcirrata,* M. Sars. Stat. 18 (—1°.0), 33 (—1°.1).	*Samytha sexcirrata,* M. Sars. Stat. 164 (—0°.7), 248 (—1°.4).	*Sabellides borealis,* M. Sars. Magdalenebay 20 f.
	Terebellidæ.	
Amphitrite cirrata, Müller. Stat. 48 (—0°.5). *Thelepus circinnatus,* Fabr. Stat. 18 (—1°.0), 31 (—1°.0), 48 (—0°.5). *Leucariste albicans,* Mgrn. Stat. 33 (—1°.1). *Terebellides Strømii,* M. Sars. Stat. 18 (—1°.0).	*Thelepus circinnatus,* Fabr. Stat. 251 (—1°.3). *Terebellides Strømii,* M. Sars. Stat. 192 (—0°.7), 225 (—0°.6).	*Thelepus circinnatus,* Fabr. Stat. 312 (—0°.2). *Scione lobata,* Mgrn. Stat. 267 (—1°.4). *Pista cristata,* Müller. Stat. 366 (—2°.1). *Terebellides Strømii,* M. Sars. Stat. 366 (—0°.2). *Ereutho Smitti,* Mgrn. Stat. 366 (—0°.2). *Trichobranchus glacialis,* Mgrn. Stat. 366 (—0°.2).
	Sabellidæ.	
Potamilla Torelli, Mgrn. Stat. 48 (—0°.5). *Potamilla Malmgreni,* n. sp. Stat. 40 (—1°.2), 51 (—1°.1). *Chone Dunéri,* Mgrn. Stat. 31 (—1°.0).	*Potamilla neglecta,* M. Sars. Stat. 124 (—0°.9), 164 (—0°.6), 251 (—1°.3). *Chone Dunéri,* Mgrn. Stat. 124 (—0°.9), 251 (—1°.3).	*Chone infundibuliformis,* Kröyer. Stat. 366 (—0°.2). *Potamilla neglecta,* M. Sars. Stat. 295 (—1°.3).
	Serpulidæ.	
Protula arctica, n. sp. Stat. 51 (—1°.1).		

Af denne Liste vil det sees, at det kun er faa Annelidefamilier, der ei ere repræsenterede i den iskolde Area og de forskjellige Familiers Repræsentanter ere mestendels Arter, der ere vel kendte fra Havstrækninger og Fjorde med tempereret Vand.

Der er kun enkelte Antydninger til, at den dybe Bundstrøm udenfor Norge, hvis Temperatur er under 0°, skulde indeholde en særlig, for den karakteristisk Fauna. For Mesteparten af de nye Formers Vedkommende er det omtrent umuligt at vide, om de ikke ogsaa ville findes udenfor eller ovenfor den iskolde Area i tempereret Vand. Der er kun et Dyr, om hvilket det med nogenlunde Sikkerhed kan antages, at det ialfald fortrinsvis, om ikke udelukkende er en Koldtvandsbeboer, nemlig *Polynoe globifera*, G. O. Sars.

Den er funden af Sars paa den ydre Skraaning af Storeggen eller den store Fiskebanke udenfor Kristiansund og Prof. Sars meddeler, at han ogsaa kender denne Form fra Lofoten. Dette kunde antyde, at den ogsaa forekommer i tempereret Vand; ellers er den kun kendt fra den iskolde Area; thi der kan neppe være Tvivl om, at jo Prof. Sars paa Udsiden af Storeggen har skrabet i iskoldt Vand; dette findes nemlig overalt ved den store Bankes Afheldning mod Atlanterhavsdybet og overalt langs eller paa denne Afheldning synes den ovennævnte Form at leve og, som det synes, i ikke saa ringe Mængde, thi Antallet af indfangede Exemplarer er ingenlunde saa lidet. Der er nu intet særligt at opdage ved dette Dyrs Bygning, der kunde karakterisere det fremfor andre som en udelukkende Beboer af iskoldt Vand eller det store Dyb. Og naar Ehlers[1]) fremsætter den Formodning, at Dybvandets Beboere stadigt rekruteres ved Afkom af Dyr, der leve paa grundere Vand og at man i denne Omstændighed kunde søge Grunden til, at disse Dybvandets Annelider ikke ere farve- og øienløse ligesom Huleboere, — saa synes en saadan Antagelse neppe at kunne opretholdes, naar der findes om og kun et eneste Exempel paa et Dyr, der er forsynet med Øine og Farve og som maa antages udelukkende at tilhøre de store Dyb. Om der nu foruden den her omtalte Form ogsaa findes andre Dyr, der udelukkende tilhøre den kolde Area, lader sig neppe med nogensomhelst Sikkerhed afgøre. Mesteparten af de i den kolde Area fundne Dyr ere, som allerede ovenfor bemærket, Former, der ere vel kendte fra Egne med tempereret Vand, og ingen andre af de i den kolde Area fundne nye Former ere fundne i saa stort Antal og saa gennemgaaende paa ensartede Lokaliteter udenfor vor hele Kyst, at vi om dem kunne antage med samme Ret som om *Polynoe globifera*, at de ere udelukkende Koldtvandsbeboere; snarere tværtom; en Form *Polynoe aspera*, der fandtes i 1876 paa Stat. 48 ved Island i den kolde Area, fandtes samme Aar af mig ved Moldøen, og en anden

[1] Ehlers: Beiträge zur Kentniss der Verticalverbreitung der Borstenwürmer im Meere. Zeitschrift für wiss. Zoologie, Bd. 55.

As will be seen from the above List, there are but few families of Annelids not represented in the frigid area; and the members of the various families occurring there consist chiefly of species also met with in fjords and tracts of ocean belonging to the temperate area.

There are few indications of any such fact, as that the deep bottom-current off the coast of Norway, in which the temperature of the water is below zero, should be characterized by a fauna of its own. As regards the great majority of new forms, it is indeed well-nigh impossible to tell whether they may not likewise be found both without and above the frigid area in water of a higher temperature than zero. Of one Annelid only, viz. *Polynoe globifera*, G. O. Sars, can we infer with comparative certainty, that its favourite, if not its sole habitat, is confined to the cold bottom-strata.

This animal was taken by Professor Sars on the outer slope of Storeggen — the great fishing-bank lying off Christiansund in Norway; and he states his having met with it, too, near the Lofoten Islands. Now, some might infer from this, that it also inhabits water of a higher temperature than zero; but in all other localities from which it is known, the animal has been invariably found to occur in the cold area only; and it will hardly admit of doubt, that Sars, on the outer slope of Storeggen, dredged in ice-cold water, since the cold area extends to where the base of the declivity meets the bottom-water of the Atlantic; and either on or along this slope the form in question would seem to occur, and in some plenty, for the number of specimens collected there was by no means inconsiderable. There is nothing, however, in the structure of this animal from which it might be regarded as exclusively inhabiting the frigid area, or indeed great depths; and when Ehlers[1] ventures to assume, that the inhabitants of the great depths have their numbers constantly recruited from the offspring of animals living in shallower water, and that in this circumstance lies the reason of deep-water Annelids not being colourless and without eyes like the inhabitants of caves (Höhlenbewohnern), such an assumption must certainly give way before the occurrence of even a single form both coloured and furnished with eyes, and whose habitat we must regard as exclusively confined to the great depths. Whether there be other animals, besides the said form, inhabiting the cold area alone, can hardly be stated with certainty. Most of the animals collected in the cold area belong to forms which, as previously stated, are well known from water of a higher temperature than zero, and none of the new forms found in the frigid area were met with off the Norwegian coast in such considerable numbers and such uniform localities as to warrant our assuming that, like *Polynoe globifera*, they exclusively inhabit the cold-water strata. Another form, *Polynoe aspera*, obtained at Stat. 48, off the coast of Ice-

[1] Ehlers: Beiträge zur Kentniss der Verticalverbreitung der Borstenwürmer im Meere. Zeitschrift für wiss. Zoologie, Bd. 55.

Form *Polynoe islandica* angives af V. Storm[1] af ham at være fundet i Trondhjemsfjorden. Og under de Omstændigheder er det selvfølgeligt umuligt, al den Stund Dyrene fra den kolde Area ingen Eiendommeligheder frembyde i sin Bygning, at have nogen begrundet Formening om, hvorvidt en ny Form, der findes i den kolde Area, udelukkende tilhører denne eller ei. Foruden det om *Polynoe globifera* anførte findes der kun nogle enkelte Antydninger til, at den kolde Area muligens har en tildels særegen Annelidefauna. De Dyr, der henhøre til Slægten *Myriochele* Mgrn., maa vel antages at være rent arktiske; der kendtes hidtil kun en Art, *M. Heeri*, Mgrn, fra Østsiden af Spitsbergen og Grønland, der ogsaa er fundet paa Porcupineexpeditionen paa Stat. 30 i en Dybde af 1380 Favne, Temp. 2°,86; og nu er der paa den norske Expedition fundet 2 nye Arter *Myriochele* paa 6 Stationer i iskoldt Vand, medens *M. Heeri* ikke er paatruffet. *Polynoe Sarsii*, Knbg., der forekommer i det kariske Hav og paa Østsiden af Spitsbergen, er fundet paa Stationerne 31, 33 og 35, alle tre tilhørende den kolde Bundstrøm mellem Island og Norge; den er ogsaa funden paa Porcupineexpeditionen vestenfor Irland paa Stat. 28, 1215 Favnes Dyb, Temp. + 2°,80. Formodentlig vilde baade *Myriochele Heeri* og *Polynoe Sarsii* ved en nøiere Eftersøgen findes paa flere mellemliggende Steder i den kolde Bundstrøm og det maa antages at være det rimeligste, at disse arktiske Dyr gennem den kolde Bundstrøm ere vandrede sydover.

At bemærke er ogsaa Forekomsten af en Serpula: *Protula arctica* paa Stat. 51, 1163 Favnes Dyb og Temp. —1°.1, Bunden bestaaende af Biloculinler. Dette viser, at Serpulaerne ikke nødvendigtvis behøve faste Genstande, paa hvilke de kunne bygge sine Skaller. Det samme har jeg tidligere erfaret, med Hensyn til *Hydroides norvegica*, som jeg ogsaa har fundet paa Slambund, og var Røret i dette Tilfælde ikke som vanligt snoet, men ret, saa det maa antages, at Rørene under disse Omstændigheder staa nede i Mudderen ligesom Rørene for mange andre tubicole Annelider, der leve paa blød Bund.

Jeg har ovenfor bemærket, at det ikke har været mig muligt at finde noget, hvorved Beboerne af den kolde Area kunde kendes fra Beboere af tempereret Vand. Dette gælder saavel Farverne som Dyrenes Størrelse. *Onuphis hyperborea* viser dette tilfulde; dette Dyr er kun fundet paa Stat. 18, 412 Favne og Stat. 48, 299 Favne, altsaa paa begge Steder paa større Dyb end de, hvortil Plantevæxt og Lys antages at trænge ned. Ikke desto mindre har Dyret en anselig Størrelse og ogsaa en meget stærk Farve, samt Øine.

Fra Stat. 48 findes ogsaa et andet Dyr, *Polynoe islandica*, der udmærker sig ved en for en *Polynoe* usædvanlige Størrelse af 80mm. Der kunde endnu nævnes flere Exempler paa, at hverken Dybden eller Vandets Temperatur synes at betinge en mindre Udvikling af Dyrene.

[1] Det Norske Videnskabsselskabets Skrifter 1878.

land in the cold area, was taken the same year by myself, off Moldøen, and a form designated *Polynoe islandica* is stated by V. Storm[1] to occur in the Trondhjem Fjord. Hence, it is impossible, since the Annelids from the cold area present no peculiarities of structure, to pronounce with certainty whether a new form met with in the cold area is exclusively confined to that depth or not. If we except what has been stated concerning *Polynoe globifera*, little remains to add in support of the inference, that a peculiar Annelid Fauna inhabits the frigid depths of the ocean. The Annelids belonging to the genus *Myriochele*, Mgrn., must be regarded as true arctic animals. As yet, but one species — *M. Heeri*, Mgrn. — has been met with, from the eastern shores of Spitzbergen and Greenland, — also found on the Porcupine Expedition, Station 30, at a depth of 1380 fathoms, temperature 2° 86; and 2 new species of *Myriochele* were taken at 6 Stations on the Norwegian Expedition, in ice-cold water, whereas *M. Heeri* did not occur. *Polynoe Sarsii*, Knbg., which inhabits the Kara Sea and the eastern shores of Spitzbergen, was met with at Stations 31, 33, and 35, — all three in the cold bottom-current flowing between Iceland and Norway; it also occurred on the Porcupine Expedition, west of Ireland, at Station 28, depth 1215 fathoms, temperature + 2°.80. Probably, careful dredging would bring to light both *Myriochele Heeri* and *Polynoe Sarsii* in several intermediate parts of the cold bottom-current; and hence these arctic animals may with good reason be assumed to have drifted southwards.

In conclusion, we must notice the occurrence of a *Serpula*: *Protula arctica*, at Station 51; depth 1163 fathoms, temperature —1°.1; bottom, biloculina clay. This shows that the *Serpulidæ* are not absolutely in need of solid matter on which to construct their shells. This is also the case with *Hydroides norvegica*, which I have met with on a muddy bottom; and the tube was not twisted — the usual form — but straight, whence may be inferred that under such circumstances the tubes penetrate the mud, as is the case with those of many other tube-building Annelids that live on a soft bottom.

As stated above, I have failed to detect any criterion whatever whereby the inhabitants of the cold area may be distinguished from those of the temperate; and this applies both to colour and to magnitude. *Onuphis hyperborea* is an instance in point. This animal was brought up at Station 18 (depth 412 fathoms) and Station 48 (depth 299 fathoms), in both localities, accordingly, at a greater depth than that to which light and vegetable life are supposed to penetrate. But the animal is nevertheless of very considerable dimensions, vividly coloured, and moreover furnished with eyes. At Station 48 was brought up another animal, *Polynoe islandica*, which, for a *Polynoe*, is remarkably large: length 80mm. Many other instances might be adduced to show that neither depth nor temperature has apparently any influence on the development of these animals.

[1] Det Norske Videnskabsselskabets Skrifter, 1878.

Forklaring af Figurerne.

Tab. I, Fig. 1. *Spinther arcticus* fra Rygfladen, noget forstørret.
— 2. Do. do., Forenden underfra med udkrænget Snabel.
— 3. Do. do. af et Tværsnit af Kroppen.
— 4. Do. do.; den sammensatte Børste i den ventrale Fodknude.
— 5. Do. do.; to dorsale Børster.
— 6. *Polynoë spinulosa*, n. sp.; Forenden.
— 7. Do. do.; en Fodknude.
— 8. Do. do.; en Elytre.
— 9. Do. do.; de tre store Knuder ved Elytrens bagre Rand.
— 10. Do. do.; Børster.
— 11. *Polynoë foraminifera*, n. sp.: Forenden.
— 12. Do. do.; en Fodknude.
— 12a. Do. do.; Børster.
— 13. Do. do.; en Elytre.
— 14. Do. do.; Foraminiferer fra Elytren.
— 15. *Polynoë islandica;* naturlig Størrelse.
— 16. Do. do.; Hovedet.
— 17. Do. do.; en Elytre.
— 18. Do. do.; et Stykke af Elytrens bagre Rand, stærkere forstørret.
— 20. *Polynoë islandica;* dorsal Børste.
— 21. Do. do.; ventral Børste.
— 22. *Polynoë assimilis;* Forenden.
— 23. Do. do.; en Fodknude.
— 24. Do. do.; en Elytre.
— 25. Do. do.; en haard Knude paa Elytren.
— 26. Do. do.; Børster.

Tab. II, Fig. 1. *Polynoë globifera.*
— 2. Do. do.
— 3. Do. do.; en Fodknude.
— 4. Do. do.; en dorsal Børste.
— 5. Do. do.; en ventral Børste.
— 6. Do. do.; en Elytre.

Explanation of the Plates.

Pl. I. fig. 1. *Spinther arcticus;* dorsal aspect, slightly magnified.
— 2. *S. arcticus;* anterior extremity, with exserted proboscis, seen from below.
— 3. *S. arcticus;* transverse section of the body.
— 4. *S. arcticus;* the compound arrangement of bristles in the ventral pedal protuberance.
— 5. *S. arcticus;* two dorsal bristles.
— 6. *Polynoë spinulosa*, n. sp.: anterior extremity.
— 7. *P. spinulosa;* an anterior protuberance.
— 8. — an elytre.
— 9. — the three large protuberances on the posterior margin of the elytre.
— 10. *P. spinulosa;* bristles.
— 11. *Polynoë foraminifera*, n. sp.; anterior extremity.
— 12. *P. foraminifera;* a pedal protuberance.
— 12a. — bristles.
— 13. — an elytre.
— 14. — Foraminifera from the elytre.
— 15. *Polynoë islandica;* natural size.
— 16. — the head.
— 17. — an elytre.
— 18. — a piece of the back margin of the elytre, magnified.
— 20. *Polynoë islandica;* dorsal bristle.
— 21. — ventral bristle.
— 22. *P. assimilis;* anterior extremity.
— 23. — a pedal protuberance.
— 24. — an elytre.
— 25. — a hard protuberance on the elytre.
— 26. *P. assimilis;* bristles.

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— 2. *P. globifera.*
— 3. — a pedal protuberance.
— 4. — a dorsal bristle.
— 5. — a ventral bristle.
— 6. — an elytre.

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— 8. Do. do. fra Elytrens bagre Rand.
— 9. Do. do.; af Randen af en af de store Knuder paa Elytrens bagre Rand.
— 10. *Polynoë aspera.*
— 11. Do. do.: Hovedet.
— 12. Do. do.; en Fodknude.
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— 14. Do. do.; en Elytre.
— 15. Do. do.; fra den bagre Rand af en Elytre.

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— 2. Do. do.; en Elytre.
— 3. Do. do.; en Fodknude.
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— 5. Do. do.; ventral Børste.
— 6. *Polynoë glaberrima;* Forenden.
— 7. Do. do.; en Elytre.
— 8. Do. do.; en Del af Elytrens ydre Rand.
— 9. Do. do.; Tentakelcirrernes Basalled eller 1ste Fodknude med sin Acicula.
— 10. Do. do.; en Fodknude.
— 11. Do. do.; Børster; *a* dorsal, *c* ventral Børste, *b* Spidsen af en ventral Børste.
— 12?. *Polynoë (Nemidia) Torelli;* Forenden.
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— 15. Do. do.; Børster af et større Individ.
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— 7. — an elytre.
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— 8. — lower jaw.

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— 19. Do. do.; Børster.

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— 6. Do. do.; en gaffelformet Børste.
— 7. Do. do.; en capillær Børste.
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— 19. *Scalibregma inflatum;* en do. do.
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Indleveret i Juni 1880.

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Translated into English by **John Hazeland.**

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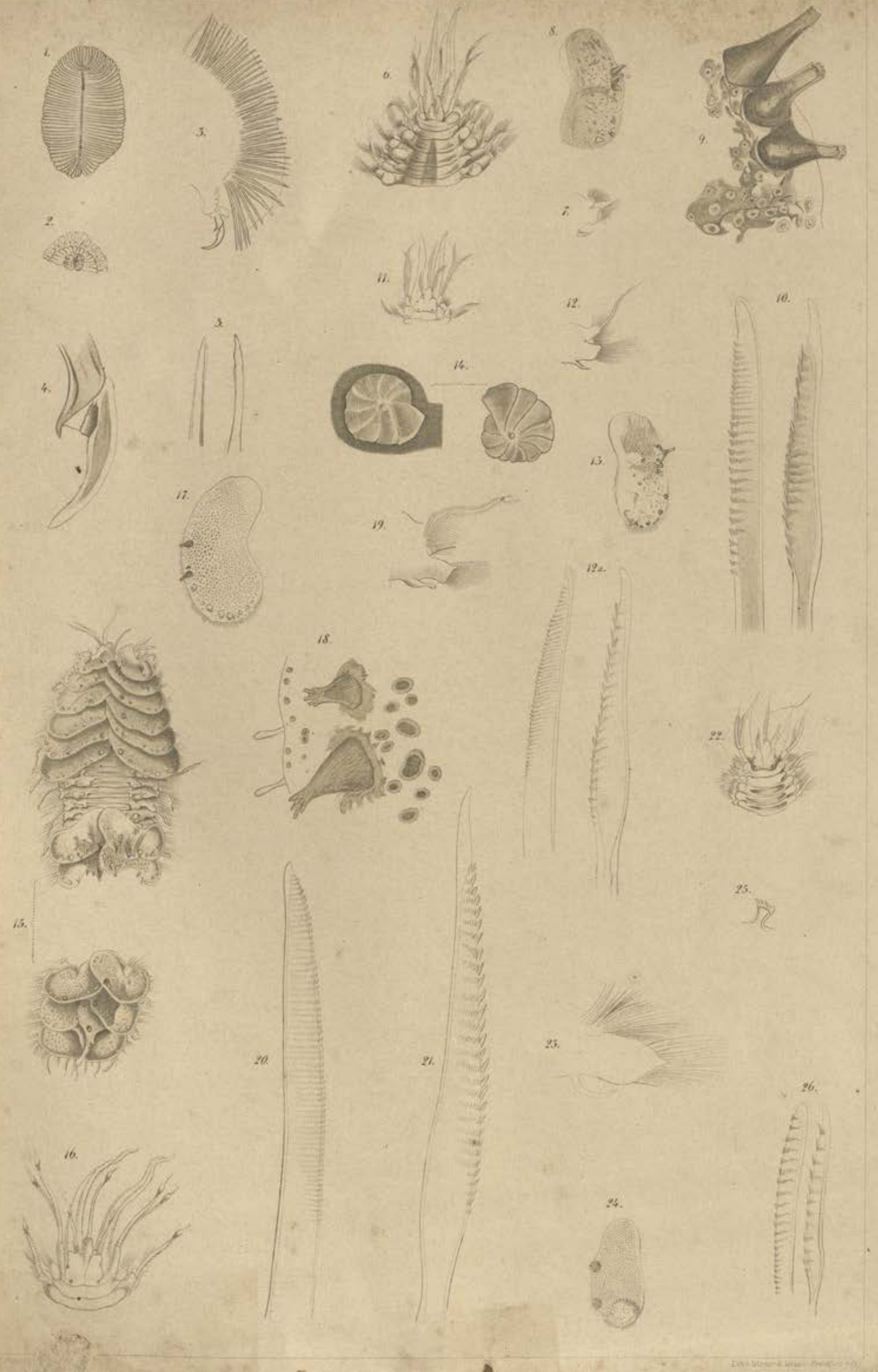
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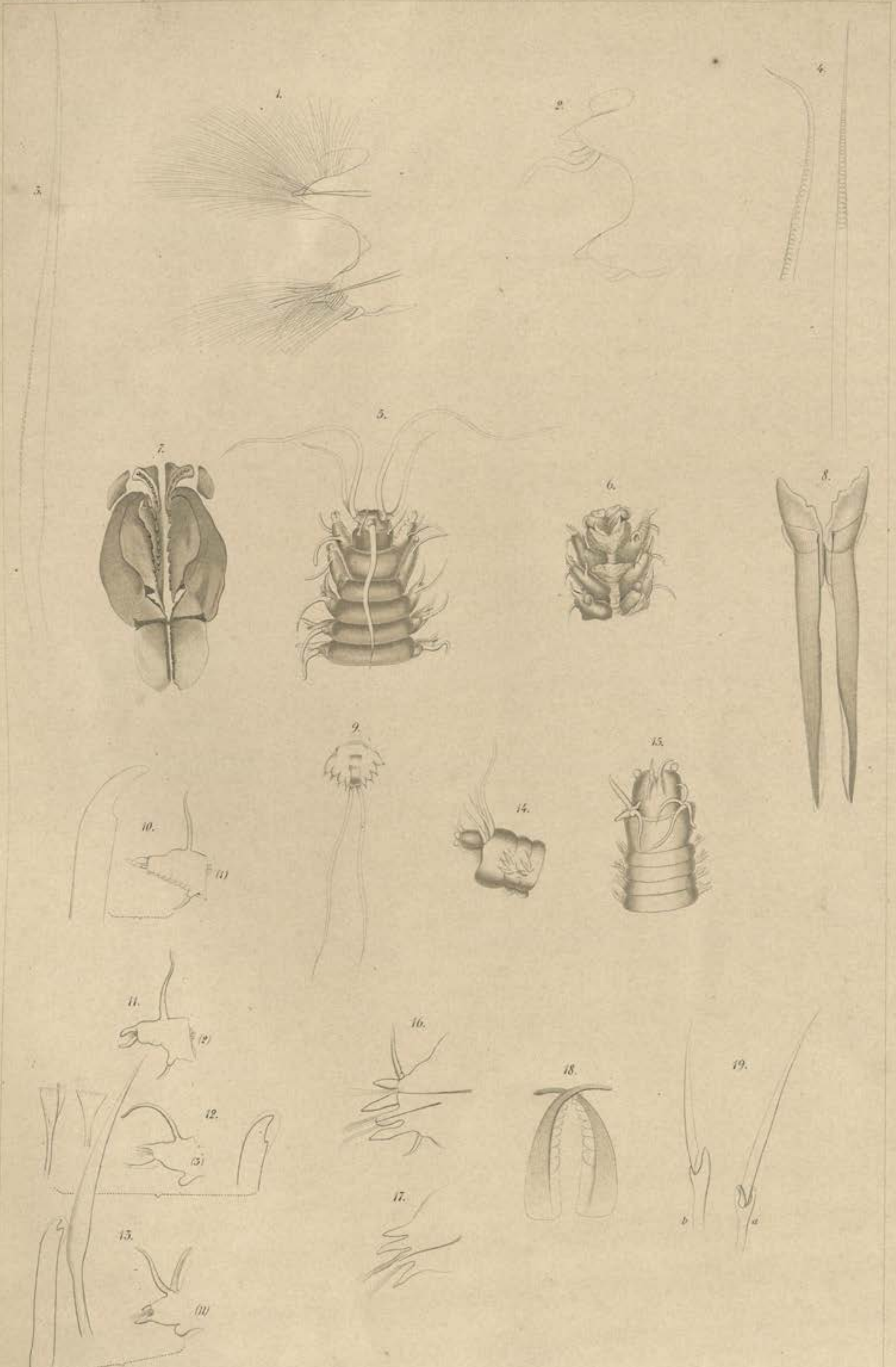
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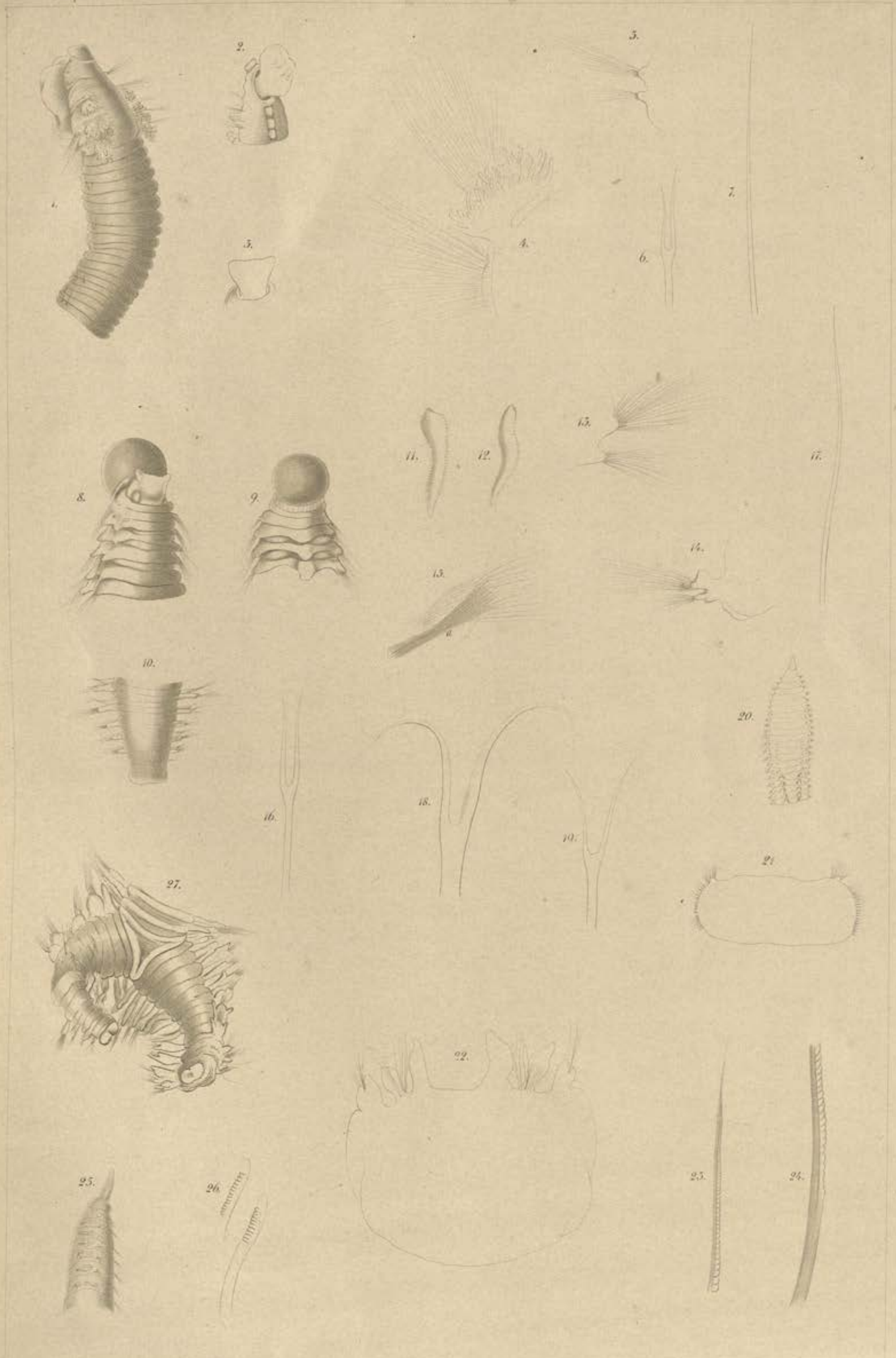
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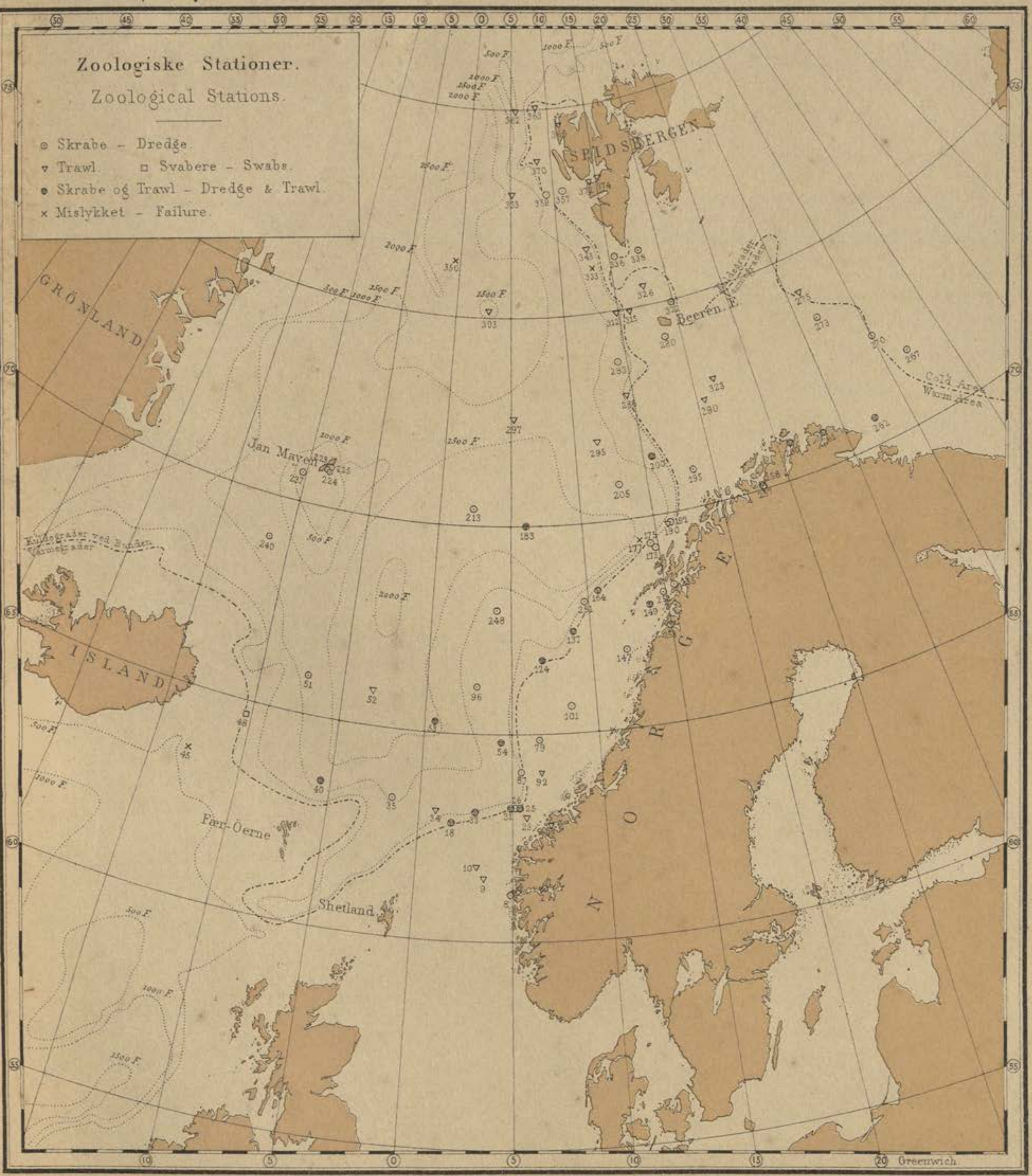

Den private Opmaalings lith. Anstalt, Kristiania.

DEN NORSKE NORDHAVS-EXPEDITION
1876—1878.

ZOOLOGI.

SPONGIADÆ,

VED

G. ARMAUER HANSEN.

MED 7 PLANCHER OG 1 KART.

CHRISTIANIA.
GRØNDAHL & SØNS BOGTRYKKERI.
1885.

THE NORWEGIAN NORTH-ATLANTIC EXPEDITION

1876—1878.

ZOOLOGY.

SPONGIADÆ,

BY

G. ARMAUER HANSEN, M. D.

WITH 7 PLATES AND 1 MAP.

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Samtlige Svampe vare opbevarede paa Alkohol; nogle faa vare indtørrede paa Grund af Karrenes mindre fuldstændige Lukning og Alkoholens deraf følgende Fordampning. Paa en hel Del Etiketter er Paaskriften skeet med Anilin-Blæk, saa den for Tiden er ulæselig, og det er forgjæves forsøgt at fremkalde denne igjen ved forskjellige Midler. Følgen heraf er, at Findestedet ikke kan angives for en hel Del af de beskrevne Svampe.

Hvorvel Svampene i det Hele er vel konserverede, har det dog ikke været mig muligt af en eneste at faa Præparater, paa hvilke jeg kunde faa Rede paa Kanalsystem, eller overhovedet paa Bløddelenes Struktur. Det eneste Holdepunkt for Svampenes Bestemmelse har derfor været Kiselnaalenes Form og Anordning. Den ydre Form giver, som bekjendt hos disse Dyr, kun i ganske faa Tilfælde mere eller mindre paalidelige Holdepunkter. Kiselnaalenes Form og Anordning synes derimod at maatte kunne bruges som Grundlag for en systematisk Inddeling. Det her behandlede Antal Svampe er imidlertid for lidet til at grundlægge et System paa, og jeg indskrænker mig derfor til at ordne Materialet efter Kiselnaalenes Form, og vil jeg, hvor det har lykkets mig at identificere en Form med en allerede tidligere beskrevet, benytte dennes Navn.

Det er ellers i Regelen yderst vanskeligt, for ikke at sige umuligt, at kunne henføre noget af de undersøgte Dyr til en allerede beskreven Form, specielt gjælder dette de af Bowerbank beskrevne; indenfor den samme Slægt forekommer hos ham saa forskjellige Kiselnaaleformer, og samme Naaleformer findes hos forskjellige Slægter, saa det bliver aldeles umuligt efter Naaleformerne alene at finde frem i Bowerbanks System. Og heller ikke er Bowerbanks øvrige Karakteristik af Slægterne af den Beskaffenhed, at man kan finde sig tilrette ved Hjælp af samme, og jeg har derfor ganske maattet opgive at finde Rede i Bowerbanks System. Om to Svampe har sine ens spids-spidse Naale ens anordnede, men der hos den ene af dem til disse Naale kommer en anden Sort, saa bliver det et Spørgsmaal, om Anordningen eller Naaleformerne skal ansees som det væsentligste til at karakterisere Slægten, og

All of the sponges were preserved in alchohol; a small number of them were shrunk, however, owing to the incomplete closing of the vessel that contained them, and consequent evaporation of the alchohol. The superscription on a large number of the distinguishing labels had been effected with Aniline ink, and these labels show, now, no trace of superscription, although several means have, subsequently, been attempted, in vain, to recall the writing. In consequence of this, it has become impossible, now, to state the habitat of a large number of the sponges.

Although, upon the whole, the sponges have been well preserved, it has not been possible, for me, to obtain preparations from a single one of them, in which I could trace out the canal system or, generally, the structure of the soft parts. The only definite feature, therefore, for the discrimination of the sponges, has been the form and arrangement of the siliceous spicules. As is known, the external form of these animals gives, in only quite a few cases, more or less trustworthy distinguishing characteristics. Upon the other hand, the form and arrangement of the siliceous spicules appear as if they might be used as a basis for a systematic classification. The number of sponges treated of in this report is too small, however, to establish a system upon, and I confine myself, therefore, to arranging the material according to the form of the siliceous spicules, and where it has been possible, for me, to identify a form with one already previously described, I will make use of the designation of that one.

It is, usually, however, extremely difficult, if not absolutely impossible, to assign any of the animals investigated, to a form previously described, and this is specially the case in regard to those described by Bowerbank. In his works we meet, included in the same genus, such divergent forms of spicules; whilst, also, we find the same spicular form in different genera; that it becomes quite impossible to trace out a path in Bowerbank's system, solely, by the spicular form. Neither are Bowerbank's other generic characteristics of such a nature, that we can see our way by the aid they afford, and I have, therefore, been obliged to relinquish the hope of assistance from Bowerbank's system. When two sponges have their uniform acuate spicules similarly disposed, and when to these spicules there is, in one of them, added, also, another kind, it becomes, then, a question, whether the disposition of the spicules, or

i denne Henseende har Bowerbank, saavidt jeg kan skjønne, neppe nok ladet Naaleformerne faa en tilstrækkelig Vægt.

Oskar Schmidt forekommer mig ogsaa at lægge for megen Vægt paa Svampenes Bløddele og øvrige Bygning i Forhold til Naalenes Form; jeg har nemlig ikke kunnet finde noget karakteristisk i de undersøgte Svampes Bløddele; Sarkoden har jeg fundet dels uden enhver Antydning til Differentiering, dels tilsyneladende traadet, meget lignende et fibrillært Bindevæv; ved Hjælp af Karmin finder man i Sarkoden temmelig talrige smaa runde Kjerner, der imidlertid ikke bidrager til at give Sarkoden nogen bestemt Karakter, og det har derfor været mig umuligt i Sarkodens Beskaffenhed at kunne finde noget, der kunde tjene til at karakterisere Svampene. Jeg er derfor kommet til det Resultat, at alene Naaleformerne kan bruges til at karakterisere Svampene; og det forekommer mig, at man i Hæckels Behandling af Kalksvampene har det Forbillede, hvorefter man burde rette sig ved Inddelingen af Kiselsvampene. Kiselnaalene er det eneste ialfald nogenledes konstante Formelement, der kan tjene til et Grundlag for en systematisk Inddeling. Om man, ved at benytte den, ogsaa vilde faa et naturligt System, derom tør jeg ingen Mening have; men jeg tror for sikkert at kunne antage, at man ved deres Hjælp vilde kunne faa et System, i hvilket det lod sig gjøre at finde sig tilrette med nogenledes Lethed; og dette maa, efter min Mening, ansees som det foreløbige Desideratum. Som allerede nævnt er det Materiale, jeg har havt under Behandling, neppe stort nok til at danne Grundlag for en systematisk Ordning af disse mangfoldigtformede Dyr, og jeg indskrænker mig derfor til at ordne dem og beskrive dem efter deres Naaleformer, det eneste, hvori jeg har fundet et Holdepunkt.

Det tør vel hænde, at jeg kommer til at beskrive allerede kjendte Former under nye Navne; men da det Gebet, hvorfra disse Svampe er opfisket, er et hidtil saagodtsom aldeles uudforsket, saa tør det vel ogsaa hænde, at Mesteparten af de fundne Dyr virkelig ere nye for Videnskaben.

Til Betegnelse af Naaleformerne benytter jeg mig af de af Dr. Vosmaer angivne Formler[1].

Svampenes ydre Form kan neppe spille nogen Rolle for deres systematiske Inddeling, men kan kanske delvis benyttes til Adskillelse af Arterne. Spiklernes Anordning forekommer mig ogsaa mestendels at spille en underordnet Rolle, hvorvel den for visse Formers vedkommende synes at være temmelig gjennemgaaende ens.

Jeg begynder med Svampe med Naaleformel ac^2

[1] Dr. G. C. T. Vosmaer: Versuch einer spongiologischen Stenographie i Tijdsschrift der nederlandsche dierkundige vereiniging. Deel V. 1881.

their form, should be considered as the most material, in the characterisation of the genus, and in this respect Bowerbank has, so far as I can gather, scarcely laid sufficient stress upon the form of the spicules.

It also appears to me, that Oskar Schmidt lays too much stress upon the soft parts, and the other structure of the sponges, in relation to the spicular form. I have, for instance, not been able to find any characteristics in the soft parts of the sponges investigated; but have found the sarcode to be, partly, without any indications of differentiation, and partly, apparently, very similar to a fibrillous connective-tissue. With the assistance of carmine, there is found in the sarcode, rather numerous, small round nuclei, which do not, however, contribute to give the sarcode any definite character, and it has been impossible, for me, therefore, to find in the nature of the sarcode, anything which would serve to characterise the sponges. I have come to the conclusion, therefore, that the form of the spicules can, alone, be used to characterise the sponges; and it appears to me, that in Hæckel's treatment of the calcareous sponges we have, the prototype upon which we ought to proceed in the classification of the siliceous sponges. The siliceous spicules are, at all events, the only, somewhat constant form-element, which can serve as a basis for a systematic classification. Whether, by its use, we would also obtain a natural system; I cannot venture to express an opinion upon; bnt I think, I may, certainly, assume, that with its aid, we might obtain a system, in which it was possible to find our way with some degree of ease, and in my opinion this must be considered to be the preliminary desideratum. As already mentioned, the material which I have had under investigation is scarcely sufficient to form the basis of a systematic arrangement of these, so multitudinously formed, animals, and I confine myself, therefore, to classify and describe them, according to the form of the spicules, this being the only point which I have found to be characteristic.

It may happen, perhaps, that I come to describe, under new designations, forms already known, but as the field from which these sponges have been obtained, is one that, hitherto, has been almost entirely uninvestigated, it may also, therefore, well happen, that the greater part of the animals found, are really new to science.

To indicate the spicular form, I make use of the formulæ given by Dr. Vosmaer[1].

The external form of the sponges can scarcely play any part in their systematic arrangement, but can perhaps be used, partially, in the distinguishing of the species. The arrangement of the spicules appears, to me, also, to play, principally, a secondary part, although, in regard to certain forms, it appears to be tolerably uniform throughout.

I commence with sponges having spicules of the form

[1] Dr. G. C. T. Vosmaer: Versuch einer spongiologischen Stenographie i Tijdsschrift der nederlandsche dierkundige vereinigung. Deel V. 1881.

eller ac^2 *sp.* Da jeg nu i den ældre Svampeliteratur ikke kan finde Svampe med denne Naaleformel samlede under et Navn og heller ikke anser mig berettiget til at danne et nyt Navn, samler jeg dem under Navnet *Reniera*, O. Schmidt, der synes mig at være den Slægt, hvorunder de med størst Ret kan indordnes. Den først omhandlede har imidlertid allerede faaet et eget Slægtnavn og er saa vel kjendt under dette, at jeg opfører den under samme Navn.

ac^2 or ac^2 *sp.* As, however, I have not found in the older works relating to sponges; sponges with this spicular formula, collected under one designation; and I do not consider myself entitled to form a new designation; I have collected them under the designation *Reniera* (O. Schmidt) which appears, to me, to be the genus to which they can with most show of reason be assigned. The first one treated of has, however, already obtained a generic designation of its own, and is so well known by it, that I present it under the same name.

Stylocordyle boreale, Lovén.

Exemplarerne er af meget forskjellig Størrelse; Stilken er paa nogle Exemplarer 1,5^{mm} tyk og Hovedet 1,5^{cm} langt og 1^{cm} i Gjennemsnit; de mindste, fra Station 18, har en 1,5 til 2,0^{cm} lang Stilk og et 3—4^{mm} langt Hoved. Der forekommer baade den af Lovén som *Hyalonema borealis* opførte Form med et Osculum midt paa Hovedets øvre Flade, og den af G. O. Sars som *Hyalonema longissima* beskrevne Form med Osculum i Randen af samme Flade; men jeg er ikke istand til at finde nogen Forskjel mellem dem.

Jeg har ikke hos nogen fundet den af Sars beskrevne og afbildede Opdrivning midt paa Naalen med Forgrening af Axekanalen, og jeg antager derfor, at denne Naaleform neppe kan være andet end Udtryk for en lokal Variation og ikke tilstrækkelig til at begrunde en Artsforskjel.

Findested.

Station 18, 33, 40, 283, 312.

Stylocordyle boreale, Lovén.

The specimens are of very various size; in a few of them, the stem is 1.5^{mm} thick, and the head is 1.5^{cm} long and 1.0^{cm} in diameter. The smallest specimen; (from station No. 18) has a stem 1.5^{cm} to 2.0^{cm} in length, and a head 3 to 4^{mm} in length. Both, the form specified by Lovén as *Hyalonema borealis*, with an osculum in the mesial part of the superior surface of the head; and the form described by G. O. Sars, as *Hyalonema longissima*, with an osculum in the margin of the same surface; occur, but I am unable to find any difference between them.

I have not been able to find, in any of them, the bulbous tumefaction in the middle of the spicule, with the ramification of the axis-canal, which has been described and illustrated by Sars; and I, therefore, presume, that this spicular form can scarcely be anything else than the expression of a local variety; and insufficient to form the basis of a specific variety.

Habitat.

Stations No. 18, 33, 40, 283, 312.

Reniera simplex, n. sp.

En pæreformig Sæk paa en temmelig lang Stilk; blød og løs i sin Struktur. Sarkoden bestaar af grønligtfarvede Klumper, i hvilken der i alle Retninger gaar Naalebundter; samtlige Naale er ac^2, let krummede. Tab. I, Fig. 9 og Tab. VI, Fig. 1.

Findested.

Station 255. 2 Exemplarer.

Reniera simplex, n. sp.

A pyriform bag, seated on a rather long stem; in structure, very soft and loose. The sarcode consists of greenish coloured lumps, in which, spicular fasciculi proceed in all directions. All of the spicules are ac^2, slightly curved. (Pl. I, fig. 9, Pl. VI, fig. 1).

Habitat.

Station No. 255. 2 specimens.

Reniera oblonga, n. sp.

Svagt gultfarvede pølseformige Svampe med en ujevn hullet og toppet Overflade, der kun indeholder ac^2, let krummede Naale, der krydse hinanden i alle Retninger. Tab. II, Fig. 5 og Tab. VI, Fig. 2.

Findested.

Station ukjendt.

Reniera velamentosa, n. sp.

En aflang, brun Svamp, meget løs i sin Bygning, med en Axe af noget fastere Konsistents, fra hvilken der udgaar Bjelker til en meget tynd Overfladehinde, i hvilken der findes talrige Aabninger i et Net af ac^2 Naale. Der findes i hele Svampen kun saadanne Naale. Tab. I, Fig. 10 og Tab. VI, Fig. 3.

Findested.

Station 262.

Reniera tubulosa, n. sp.

Et Brudstykke af en Svamp, en Plade, paa hvilken der sidder 5 Rør af 2—3^{cm} Længde; da disse Rør aabne sig paa Underfladen af Pladen, ser det ud, som om denne kun var en Del af en større Væg, der kunde have omsluttet en større Hulhed, ind i hvilken Rørene har havt sin Udmunding, idet disse sidste rimeligvis har været Svampens Oscula. Det bringer en til at tænke paa Rev. Normanns Beskrivelse af *Oceanapia Jeffreysii*[1]; men der findes i vort Brudstykke ingen bihamate Spikler, kun ac^2 Naale. Tab. I, Fig. 12 og Tab. VI, Fig. 4.

Findested.

Station 1.

Reniera membranacea, n. sp.

Et temmelig stort, tyndt, gjennemskinnende Blad med hvidlige, toppede Fortykkelser. Det dannes af ac^2 *sp.* Naale, der ligger temmelig tæt pakkede og krydser hinanden i

[1] A Monograph of the British Spongiadæ, Bowerbank. Vol. IV, pag. 171.

Reniera oblonga, n. sp.

Faint-yellow coloured, sausage shaped sponge, with an uneven, conically pitted surface, which contains only, ac^2 spicules, slightly curved, and intersecting each other in all directions. (Pl. II, fig. 5, Pl. VI, fig. 2).

Habitat.

No record.

Reniera velamentosa, n. sp.

An oblong, brown coloured sponge; very loose in structure, and having an axis of somewhat firmer consistency, from which rods proceed to a very thin superficial membrane, in which numerous apertures forming a reticulation composed of ac^2 spicules occur. Only such spicules are to be found in the entire sponge. (Pl. I, fig. 10, Pl. VI, fig. 3).

Habitat.

Station No. 262.

Reniera tubulosa, n. sp.

A fragment of a sponge, consisting of a plate upon which there are seated 5 tubes, measuring 2 to 3^{cm} in length. As these tubes debouch on the inferior surface of the plate, it appears, as if the fragment was only a portion of a larger wall which may have enclosed a larger cavity in which the tubes have had their discharge; as they have, presumably, been the oscula of the sponge. This causes one to reflect on the Rev. A. M. Norman's description of *Oceanapia Jeffreysii*[1]; but in our fragment, no bihamate spicules are found, only ac^2 spicules being visible (Pl. I, fig. 12, Pl, VI, fig. 4).

Habitat.

Station No. 1.

Reniera membranacea, n. sp.

A rather large, thin, translucent and soft sponge, with whitish conical tumefactions. It is formed of ac^2 *sp.* spicules, which are placed, pretty closely packed together, and inter-

[1] A Monograph of the British Spongiadæ, Bowerbank. Vol IV, pag. 171.

alle Retninger; de hvidlige Fortykkelser ere smaa Pyramider, der er opbyggede af samme Sort Naale og paa hvis Spidse der ingen Aabning kan opdages; muligens har Svampen ved Hjælp af disse været fæstet til sit Underlag. Tab. I, Fig. 11 og Tab. VI, Fig. 12.

Findested.

Station ukjendt.

De følgende Dyr har istedetfor Naale af Formelen ac^2 saadanne med Formelen *trac*, altsaa stumpe i den ene Ende og spidse i den anden. De burde derfor kanske rettest opføres under et andet Slægtnavn end de foregaaende; men da der blandt de af Oskar Schmidt under *Reniera* beskrevne Dyr findes Former med stump-spidse saavelsom med spids-spidse Naale, saa beholder jeg dette Slægtsnavn ogsaa for disse Former.

Reniera digitata, n. sp.

En Svamp med fem lappeformige Forgreninger fra en fælles Stilk, temmelig blød og løs i Strukturen, har kun *trac* Naale, dels rette, dels krummede, enkelte dobbelt krummede. Tab. I, Fig. 5.

Findested.

Station 260.

Reniera nivea, n. sp.

Dels enkle Personer, dels Samlinger af saadanne paa tynde Plader; de enkelte Svampe er aflange, tildels pæreformige, dels cylinderformede, nogle aabenmundede, andre lukkede for Enden. Sækkens Vægge har en Tykkelse af omtrent 0,5mm, og inde i en af dem fandtes en kornet Masse, i hvilken der forekom spredte Kiselnaale, medens de andre var tomme. Væggene dannes af parallelt gaaende tykkere Naalebundter, udenpaa hvilke der findes tvertgaaende Naalebundter i nogenledes regelmæssige Afstande fra hinanden, men forresten krydsende hinanden under mere eller mindre spidse Vinkler. I de af disse Naale dannede Masker findes Huller, der gjennembore hele Væggen. Ytterst findes et Lag af korte Naale, der staar perpendikulært

secting each other in all directions. The whitish tumefactions are small pyramids, constructed of the same kind of spicules, and upon whose points no aperture can be detected. The sponge has, possibly, been attached by means of these to its original support. (Pl. I, fig. 11 Pl. VI, fig. 12).

Habitat.

No record.

The following animals, instead of having spicules resembling the formula ac^2, have spicules according to the formula *trac*, or blunt at the one extremity and acuate at the other extremity. They ought, therefore, perhaps, with mostshow of reason, to be classified under another generic designation than the preceeding ones, but, as amongst those animals described by Oskar Schmidt under the designation *Reniera*, there are found forms of spicules with blunted points, as well as with acuate points, I have retained this generic designation, also, for these animals.

Reniera digitata, n. sp.

A sponge having five lobate branches proceeding from one common stem; rather soft and loose in its structure. It has spicules of the formula *trac* only; partly straight, partly, in single curves, and partly, with a few spicules having double curves (Pl. I, fig. 5).

Habitat.

Station No. 260.

Reniera nivea, n. sp.

Occasionally, isolated individuals, occasionally, collections of them, upon thin plates. The isolated sponges are oblong, partly, pyriform, and partly, cylindrical: a few are open-mouthed, whilst others, again, are closed at the extremities. The walls of the bag have a thickness of about 0.5mm, and contained in one of the bags was found, a granular mass, in which scattered siliceous spicules appeared, whilst the others were empty. The walls are formed of parallel, thickish spicular fasciculi, outside of which, transversal spicular fasciculi are found, placed at somewhat regular intervals from each other, but, otherwise, intersecting each other at more or less acute angles. In the reticulation formed by these spicules; perforations occur, which completely pene-

paa de underliggende. Samtlige Naale er *trac* eller *tr⁰ac*; disse sidste findes dog kun i ringe Antal. Tab. I, Fig. 6.

Findested.

Station ukjendt.

Reniera palescens, n. sp.

En vifteformig, lysgraa, liden Svamp, i hvilken der kun findes *trac* Naale, Mesteparten mere eller mindre krummede, enkelte rent bueformige. Tab. I, Fig. 2.

Findested.

Station 8.

Reniera dubia, n. sp.

En brun, klumpet, blød Svamp, der sidder paa en Oculinastok. Den indeholder kun *trac*, *tr⁰2* og enkelte *ac²* Naale. De afstumpede Ender af Naalene er dels afrundede, dels tvert afskaarne og i begge Tilfælde forsynede med smaa Tagger. Tab. II, Fig. 1 og Tab. VI, Fig. 7.

Findested.

Station 270.

Reniera infundibiliformis, n. sp.

Tragtformige Bægere, der sidder fæstede paa en Algestilk, meget løse i Bygningen, bestaar af et aabent Net af *trac* Naale, dels rette, dels svagt krummede. Der fandtes en enkelt *tr²* og en *tr⁰ac* Naal. Tab. I, Fig. 7 og Tab. VI, Fig. 11.

Findested.

Station 201.

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trate the walls of the meshes. Quite on the outside, there is found, a layer of short spicules, which is placed, perpendicularly, upon the subjacent one. All the spicules are according to the formula *trac* or *tr⁰ac*. The last, however, are only found in small numbers (Pl. I, fig. 6).

Habitat.

No record.

Reniera palescens, n. sp.

A fan-shaped, light-grey coloured, sponge; in which, spicules according to the formula *trac* are alone found, the greater part of them being, more or less curved; a few purely arcuate (Pl. I, fig. 2).

Habitat.

Station No. 8.

Reniera dubia, n. sp.

A brown coloured, lumpy, soft sponge, seated on an oculina stalk. It contains only *trac*, *tr⁰2*, and a few *ac²* spicules. The blunted extremities of the spicules are partly rounded, and partly, truncated, and in both cases, they are furnished with small aculeæ (Pl. II, fig. 1, Pl. VI, fig. 7).

Habitat.

Station No. 270.

Reniera infundibiliformis, n. sp.

Funnel-shaped chalices, situated upon an alga stem; very loose in structure, and consisting of an open reticulation of *trac* spicules, partly, straight, partly, gently curved. A solitary *tr²* and a *tr⁰ac* spicule was found (Pl. I, fig. 7, Pl. VI, fig. 11).

Habitat.

Station No. 201.

Reniera complicata, n. sp.

En lysgraa Svamp, tilsyneladende grenet, men snarere bladet, en sammenhængende flad Masse, paa hvilken der findes fremstaaende Kanter eller Blade paa begge Flader. Naalene er samtlige Stavnaale, men af temmelig forskjellig Form; dels ac^2 tynde rette, bøiede eller mangfoldigt krummede, dels *trac*, temmelig tykke og svagt bøiede, dels tr^2, ligeledes tykke og svagt bøiede og endelig tr^0ac og *trac*, tynde, rette og almindeligt forsynede med en eller to kugle- eller halvkugleformige Opdrivninger. Tab. I, Fig. 8 og Tab. VI, Fig. 8.

Findested.

Station 84.

Reniera inflata, n. sp.

En liden hvid Svamp, der danner en Blære paa en hul Stilk; Blæren ved sin øvre Ende besat med flere koniske, hule Papiller, lukkede for Enden. Blærens saavelsom Stilkens og Papillernes Vægge opbyggede af tr^2 Naale, der krydse hinanden under omtrent rette Vinkler. Tab. I, Fig. 4.

Findested.

Station ukjendt.

De nu følgende Svampe, som jeg henregner til *Suberitidæ*, har samtlige Spikler af Formelen tr^0ac og kun saadanne. Jeg begynder med før beskrevne Former.

Radiella sol, O. Schmidt.

Trichostemma hemisphäricum, G. O. Sars.

Halicnemia hemisphärica, Marenz.

Oscar Schmidt har allerede gjort opmærksom paa, at hans *Radiella sol* er identisk med Sars's *Trichostemma hemisphericum*. Efter Schmidts Beskrivelse og Figur i hans „Atlant. Spongien" skulde man neppe tro dette; men Bergens Museum har faaet et Exemplar af *Radiella sol* fra Smithsonian Institution og ved at undersøge dette har jeg kunnet overbevise mig om, at begge Former virkelig er identiske. Fra Expeditionen foreligger der et Exemplar, der i Størrelse fuldkomment svarer til det amerikanske, medens Mesteparten er meget større. At identificere den

Reniera complicata, n. sp.

A light-grey coloured sponge, apparently branchy, but really rather leafy; a continuous flat mass, upon both of whose surfaces, protuberant edges, or leaves are found. All the spicules are rod-spicules, but of rather divergent form; partly ac^2 spicules, which are thin, straight, curved, or corrugated; partly *trac* which are pretty thick and gently curved; partly tr^2 also thick, and gently curved; and finally, tr^0ac and *trac* spicules, thin, straight, and usually, furnished with one or two spherical or semispherical protuberances (Pl. I, fig. 8, Pl. VI, fig. 8).

Habitat.

Station No. 84.

Reniera inflata, n. sp.

A small white sponge, forming a vesicle upon a hollow stem. The superior extremity of the vesicle is beset, with several conical hollow papillæ closed at the extremity. The walls of the stem, papillæ, and vesicle, are composed of tr^2 spicules, which intersect each other at, nearly, right angles (Pl. I, fig. 4).

Habitat.

No record.

The sponges which now follow, I have assigned to the *Suberitidæ*. Their spicules are all according to the formula tr^0ac; and these alone. I commence with forms previously known and described.

Radiella sol, O. Schmidt.

Trichostemma hemisphericum, G. O. Sars.

Halicnemia hemispherica, Marenz.

Oscar Schmidt has, already, called attention to the fact, that his *Radiella sol* is identical with Sar's *Trichostemma hemisphericum*. According to Schmidt's description, and the illustration given in his „Atlant. Spongien", this seems scarcely credible; but the Bergen Museum has obtained a specimen of *Radiella sol* from the Smithsonian Institution, and after investigating it, I have been able to satisfy myself that both of these forms are, really, identical.

During the Norwegian North-Atlantic Expedition, one specimen was obtained, which in size, quite corresponds

med Bowerbanks *Halicnemia*, som Marenzeller gjør, gaar derimod ikke an, hvis jeg skal dømme efter et Præparat af Spiklerne af *Halicnemia patera*, som jeg har faaet af Rev^d^. A. M. Normann.

Findested.

Station 29, 260, 323.

Rinalda uberrima, O. Schmidt.

Af denne Form er der fanget en Masse Exemplarer af meget forskjellig Størrelse, som det kan sees af Tab. VI, Fig. 19. Jeg henfører til denne Form en Svamp, som er afbildet Tab. VI, Fig. 10, skjønt den ikke besidder saa store Papiller som de øvrige Exemplarer, men dens Bygning forresten er ganske den samme som hos *Rinalda*, idet den har en tynd, 1—2^{mm} tyk Skorpe af lysere Farve end Resten af Svampen, og som dannes af tætstaaende korte og tynde *trac* Naale (se Tab. I, Fig. 1).

Naalene ere for Størstedelen *trac*, ikke *tr⁰ac* som hos de øvrige Exemplarer af *Rinalda*; men der findes dog Overgangsformer til *tr⁰ac*, som det kan sees af Tab. I, Fig. 1, ligesom der hos *Rinalda* findes *trac* Naale og lignende Overgangsformer, som det kan sees af Tab. II, Fig. 8.

Findested.

Station 286.

Thecophora semisuberites, O. Schmidt.

Thecophora elongata, Marenz.

— ibla, W. Thomson.

Af denne Form er der ogsaa fanget en stor Mængde, og der findes alle Overgange mellem den af Marenzeller som *Th. elongata* opførte Form og den sædvanlige *Th. semisuberites*. I de mindste Exemplarer, der ere konisk tilspidsede, findes kun en Antydning til en Pudedannelse, idet der oppe i Spidsen findes en Del smaa Naale, der dog ikke danne noget sammenhængende Lag, men ligge spredt inde mellem de spidse Ender af de lange Naale. I lidt større Exemplarer findes allerede et tydeligt Lag af smaa Naale for Enden af Svampen.

W. Thomsons *Th. ibla* skiller sig fra *Th. semisuberites* kun derved, at de smaa Naale, der danne Puden, staar

with the American specimen, whilst, the others are much larger. To identify *Radiella sol* with Bowerbank's *Halicnemia* as Maranzeller has done, is however, not possible, if I may judge from a preparation of the spicules of *Halicnemia patera* which I have obtained from the Rev^d^. A. M. Norman.

Habitat.

Stations No. 29, 260, 323.

Rinalda uberrima, O. Schmidt.

Of this form, there has been obtained a large number of specimens, of very various size, as may be seen from Pl. VI, Fig. 19. To this form I, also, assign a sponge which is illustrated Pl. VI, fig. 10, although it does not possess such large papillæ as the other specimens, but its structure, otherwise, is the same as in *Rinalda*, in so far, that it has a thin 1—2^{mm} thick crust of lighter colour than the rest of the sponge, formed of closely-set, short, thin spicules of the *trac* formula (vide Pl. I, fig. 1).

Most of the spicules are *trac*, and not *tr⁰ac* as in the rest of the specimens of *Rinalda*; but there are, also, found transition-forms towards the *tr⁰ac* formula, as may be seen in Pl. I, fig. 1; whilst, also, in *Rinalda*, there are found *trac* spicules and similar transition-forms, as may be seen in Pl. II, fig. 8.

Habitat.

Station No. 286.

Thecophora semisuberites, O. Schmidt.

Thecophora elongata, Marenz.

— ibla, W. Thomson.

Of this form, a large number has also been obtained, and there are found, all transition-forms between the form *Th. elongata*, established by Marenzeller, and the usual form of *Th. semisuberites*. In the smallest specimens, which also, are conically acuminated, there is found, only an indication of a terminal cortical layer, in as much as, that up at the point, there is found a number of small spicules, which do not, however, form a continuous layer, but are found situated, dispersed between the acuate extremities of the long spicules. In the larger specimens, there is already found, a distinct layer of small spicules at the extremity of the sponge.

W. Thomson's *Th. ibla* differs from *Th. semisuberites*, only, in this, viz. that the small spicules which form the

sammen i Bundter, hvad der foranlediger, at Puden ser ud, som om den var dannet af smaa Papiller, medens den hos *Th. semisuberites* er glat.

Findested.

Station 29. 35. 125. 205. 257, 290, 292.

Polymastia penicillus, (Mont) Vosm.

Vosmaer har i „Niederl. Archiv für Zoologi, Supplementband I" givet en udførlig Beskrivelse af denne Art med Figurer, hvorfor jeg ikke indlader mig paa nærmere at karakterisere den. De indfangede Exemplarer er meget store, 7—8^{cm} i Gjennemsnit.

Findested.

Station 267?

Spikelanordningen hos denne Art er nu akkurat den samme som hos de ovenfor nævnte Arter, størst er imidlertid Ligheden med *Radiella sol*, og det er visselig urigtigt at give disse Dyr forskjellige Slægtsnavne. Vilde man tildele Konsistentsen nogen Vægt som Slægtskarakter, kunde man henføre *Polymastia penicillus* og *Radiella sol* til en Slægt, *Rinalda uberrima* og *Thecophora semisuberites* til en anden. Men alle har de som fælles Kjendemærker, at de kun besidde $tr^{0}ac$ Naale og at disse er saaledes anordnede, at der i den ydre Skorpe findes kortere og tyndere Naale palisadeformigt anordnede og indenfor findes de længere Naale i radiært udstraalende Bundter, der kun naar ud til Skorpens indre Begrændsning eller som hos *Polymastia* tildels gjennembore denne.

Der findes endnu nogle Svampe, der kun har $tr^{0}ac$ Naale, men hos hvem Naalenes Anordning er en anden end hos de ovenfor opregnede og som jeg opfører under Navnet *Suberites*.

Suberites alveus, n. sp.

En liden Svamp af Form som en Bikube, med en Naalekrands rundt Basis (Tab. II, Fig. 3, *a*). Paa Gjennemsnittet sees en lysere Corticalmasse at omgive en bruntfarvet Centralmasse og midt paa Basalfladen sees en lysfarvet Tap (Fig. 3, *b*). Denne Tap og hele Corticalmassen forresten er dannet af lange $tr^{0}ac$ Naale. Disse Naale ligger langs hele den konvexe Flade tæt pakkede og tilnærmelsesvis parallele; dog er hele Overfladen fint bustet

cortical layer are placed together in fasciculi, and this imparts to it, the appearance of being formed of small papillæ whilst, in *Th. semisuberites* it is smooth.

Habitat.

Stations Nos. 29. 35. 125. 205. 257. 290. 292.

Polymastia penicillus, (Mont) Vosm.

In „Niederl. Archiv für Zoologi, Supplementband I", Vosmaer has given a detailed description of this species, accompanied by illustrations; and for this reason, I do not, here, more minutely, characterise it. The specimens collected are very large, being 7—8^{cm} in diameter.

Habitat.

Station No. 267?

In this species, the spicular arrangement is very similar to that of the previously named species; the similarity is, however, greatest in the case of *Radiella sol*, and it is, certainly, incorrect to assign to these animals different generic designations. If we place reliance upon the consistency as a generic characteristic, we might assign *Polymastia penicillus* and *Radiella sol* to one genus, and *Rinalda uberrima* and *Thecophora semisuberites* to another. But, all of them have, as a common distinguishing feature, only, $tr^{0}ac$ spicules, and these arranged in such manner, that in the exterior crust, shorter and slenderer spicules are arranged in form of a palisade, and inside these again, the longer spicules are found, placed in radiating fasciculi which extend, only, to the inner margin of the crust, or, partially, penetrate it, as in *Polymastia*.

There are also found, yet, a few sponges which have only $tr^{0}ac$ spicules, but in which the arrangement of the spicules is dissimilar from that found in the above-named; and these, I have ranked under the designation *Suberites*.

Suberites alveus, n. sp.

A small sponge of bee-hive shape, having a spicular wreath around the base (Pl. II, fig. 3, *a*). The sectional aspect shows, a light coloured cortical mass, surrounding a brown coloured central substance, and in the middle of the basal surface, a light-coloured prominence (Pl. II, fig. 3, *b*). This prominence as well as, also, the whole of the cortical mass, otherwise, is formed of long $tr^{0}ac$ spicules. These spicules are placed along the entire convex surface,

ved fremragende Spidser af Naalene (Tab. II, Fig. 3, *c*). Paa Basis er Naalene anordnede i Bundter, der med sine Baser rage ind i den centrale grøntfarvede Sarkodemasse, medens Naalene divergere og rage frit frem paa Underfladen; mellem disse Naalebundter findes smækrere Naale, der udfylde Rummene mellem Bundterne (Tab. II, Fig. 3, *c*). Naalens Form sees af Tab. II, Fig. 3, *d*.

Findested.

Station 205.

Suberites conica, n. sp.

En liden hvid Svamp, der sidder fastvoxet paa et Brudstykke af en Serpulaskal; den har samme Form som den foregaaende, men ingen Spikelkrands omkring Basis. Dens Centralmasse er gulbrun og skinner igjennem det farveløse Corticallag. Denne dannes udelukkende af *tr*^{0}*ac f* Spikler med temmelig varierende Form af Naalenes Hoveder (Tab. II, Fig. 6). Den gulbrune Centralmasse er gjennemsat af lignende Naale.

Findested.

Station 205.

Suberites incrustans, n. sp.

En tynd, brunlig Skorpe, fastsiddende paa en Sten; Overfladen dannes af en Række tætpakkede korte Knappenaale, medens disse indenfor er længere og tykkere og ligge samlede i Bundter uden nogen bestemt Anordning (Tab. II, Fig. 10, Tab. VI, Fig. 13).

Findested.

Station 79.

Suberites radians, n. sp.

En liden, flad, rund Svamp med en Krands af Spikler langs Randen, har i sit Ydre megen Lighed med *Radiella sol*, men Anordningen af Spiklerne er en anden, idet de hos denne er ordnede som hos *Sub. alveus*; Spikelbundterne straale ud fra den konvexe Overflade og paa

and are, closely, set together, nearly parallel; but still, the surface has a finely hispid appearance, caused by the projecting points of the spicules (Pl. II, fig. 3, *c*). At the base, the spicules are placed in fasciculi, and their bases project into the central green-coloured sarcodal substance, whilst the spicules become divergent, and project, freely, forward on the inferior surface. Between these spicular fasciculi, thinner spicules are also found, occupying the spaces between the fasciculi (Pl. II, fig. 3, *c*). The form of the spicules is seen in Pl. II, fig. 3, *d*.

Habitat.

Station No. 205.

Suberites conica, n. sp.

A small white sponge, which is seated upon and is firmly adherent to a fragment of the shell of a serpula It has the same form as the preceding one, but without the spicular wreath around the base. It's central substance, or mass, is yellowish-brown in colour, and appears visible through the colourless cortical layer. This is formed, exclusively, of *tr*^{0}*ac f* spicules, with rather varying forms of spicular heads (Pl. II, fig. 6). The yellowish-brown central substance is, also, occupied by similar spicules, which intersect it throughout.

Habitat.

Station No. 205.

Suberites incrustans, n. sp.

A thin, brownish crust, firmly seated on a stone. The surface is formed of a series of closely packed, short, pin-shaped spicules; whilst interiorly, these are longer and thicker, and occur collected in fasciculi, without, however, any definite regularity of arrangement (Pl. II, fig. 10, Pl. VI, fig. 13).

Habitat.

Station No. 79.

Suberites radians, n. sp.

A small, flat, round sponge, with a wreath of spicules along its margin. In outward appearance, it much resembles *Radiella sol*, but its spicular arrangement is different, in so far, that in this specimen, the arrangement is like that of *Sub. alveus*. The spicular fasciculi radiate from the convex

Basis findes et Lag af kortere Spikler, hvis Spidser rager frit ud paa Underfladen og langs Randen er længere end forresten paa Underfladen og saaledes danne Spikelkrandsen langs Randen (Tab. II, Fig. 7).

Findested.

Station ukjendt.

Suberites glabra, n. sp.

En langagtig, rund Stilk, der kun bestaar af *tr⁰ac* Naale, som danner et Maskeværk uden bestemt Anordning af Maskerne. I Overfladen sidder kortere Naale perpendikulært paa samme (Tab. II, Fig. 9).

Findested.

Station ukjendt.

Desmacidinæ.

Ligeoverfor disse Svampe er jeg i stor Forlegenhed, da jeg ikke med Sikkerhed ved at henføre de forskjellige Former til de af Vosmaer [1] opstillede Genera. Jeg begynder med nogle Svampe, som jeg antager hører til *Myxilla*.

Myxilla exigua, n. sp.

Et tyndt, hvidligt Lag paa Skallen af en bivalv (Terebratula?); det bestaar af et forvirret Net af *trac* og *trac sp.* Naale, mellem hvilke der findes talrige *anc-anc*, 3 (Tab. II, Fig. 2).

Findested.

Station ukjendt.

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[1] Vosmaer: The family of the Desmacidinæ. — Notes from the Leyden Museum. Vol. II, 1879.

surface, and at the base, there is found a layer of shorter spicules, whose points, freely, project on the inferior surface and along the margin, in which last named situation they are longer than on the inferior surface, otherwise, and produce, thus, spicular wreaths along the margin (Pl. II, Fig. 7).

Habitat.

No record.

Suberites glabra, n. sp.

An elongate, round stem, which is composed, exclusively, of *tr⁰ac* spicules, forming a reticulation without any definite regularity of the meshes. On the surface, short spicules appear, placed perpendicularly in it (Pl. II, Fig. 9).

Habitat.

No record.

Desmacidinæ.

In regard to these sponges, I find myself in a great difficulty; because, I do not see my way, clearly, to assign with certainty, the various forms, to the genera established by Vosmaer [1]. I commence with a few sponges which I suppose to pertain to *Myxilla*.

Myxilla exigua, n. sp.

A thin, whitish layer, on the shell of a bivalve (Terebratula?). It consists of a confused reticulation of *trac* and *trac sp.* spicules, between which numerous *anc-anc* 3, spicules appear (Pl. II, fig. 2).

Habitat.

No record.

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[1] Vosmaer. The family of the Desmacidinæ. — Notes from the Leyden Museum. Vol. II, 1879.

Myxilla grisea, n. sp.

En flad, grenet, lysegraa Svamp (Tab. VI, Fig. 9), der foruden *anc*² 3 Spikler kun har glatte Spikler, dels tynde *tr*², dels tykke, *tr*² og *trac* Spikler. De to sidstnævnte Former er lidt krummede (Tab. I, Fig. 3).

Findested.

Station 84.

Myxilla brunnea, n. sp.

En stor, bladdannet Svamp af brun Farve (Tab. VI, Fig. 5), der har en hul Overflade. Den har ingen faste Fibre (keratode Fibre). Saavidt det kunde iagttages, bestod dens Spikler af *ac*² *sp.* og *tr*² *sp.* svagt krummede, desuden *anc*² 3 (Tab. III, Fig. 1 *A*).

Findested.

Station 275.

Myxilla flabelliformis, n. sp.

Ogsaa et stort, vifteformigt Blad, men af graa Farve (Tab. VI, Fig. 6). Heller ikke det har nogen faste (keratode) Fibre. Dets Spikler ere *ac*² og *anc*² 3 (Tab. II, Fig. 14).

Findested.

Station 359.

Jeg har betegnet de to følgende Svampe *Sclerilla*, og ved at gjøre dette lagt Vægt paa Spiklerne alene uden at skjænke Schmidts Sarkode-Membran og Fibre nogen Opmærksomhed.

Sclerilla arctica, n. sp.

En graafarvet, flad Kage med runde Kanter, noget aflang og forsynet i den ene Ende med en fragmentær Overflade, der kunde synes at vise, at den har siddet paa en tynd Stilk (Tab. VI, Fig. 15). Den bestaar af Bundter af *ac*² Spikler, og imellem disse Bundter finder man en farveløs Sarkode, hvori man opdager *anc*² 3 Spikler. I Periferien er der et Lag af kortere *ac*² *sp.* Spikler, som ere tæt sammenpakkede og skjære hinanden i alle Retninger

Myxilla grisea, n. sp.

A flat, branchy light-grey sponge (Pl. VI, fig. 9) which has, besides *anc*² 3 spicules, only, smooth spicules, partly, thin *tr*², partly, thick *tr*² and *trac* spicules; both the last named forms being slightly curved (Pl. I, fig. 3).

Habitat.

Station No. 84.

Myxilla brunnea, n. sp.

A large, leaf-shaped, brown coloured sponge (Pl. VI, fig. 5) having a cavernous surface. It has no solid fibres (keratode fibres). As far as could be observed, its spicules consisted of *ac*² *sp.* and *tr*² *sp.* gently curved, besides *anc*² 3, (Pl. III, fig. 1 *A*).

Habitat.

Station No. 275.

Myxilla flabelliformis, n. sp.

Also a large leaf, of fan-shape, but grey in colour (Pl. VI, fig. 6). Neither does it contain any keratode fibres. Its spicules are *ac*² and *anc*² 3, (Pl. II, fig. 14).

Habitat.

Station No. 359.

I have designated the two following sponges, *Sclerilla*, and in doing so, lay stress upon the spicules only, without paying any attention to Schmidt's sarcode membrane and fibres.

Sclerilla arctica, n. sp.

A grey-coloured, flat, cake with rounded margins, somewhat oblong, and furnished at the one extremity, with a fragmentary surface, which would appear to show, that it had been seated on a thin stem (Pl. VI, fig. 15). It consists of fasciculi of *ac*² spicules, and between these fasciculi, there is found a colourless sarcode, in which *anc*² 3 spicules appear. In the periphery, there is a layer of shortish *ac*² *sp.* spicules, which are closely packed, and intersect each

(Tab. II, Fig. 4). Lignende Spikler findes ogsaa paa den indvondige Side af Svampen siddende mellem de glatte ac^2 Spikler.

Findested.

Station 8, 275.

Sclerilla dura, n. sp.

En aflang, pæreformig, haard Svamp med en kort, krummet Stilk og med en liden Ophøining paa den øvre Ende, som er uden nogen Aabning.

Den er dannet ligesom det foregaaende Exemplar. ac^2 Spikler udspringe efter Længden langs Axen, parallele i Midten og udstraalende i Bundter henimod Periferien, der ogsaa ligner den sidst omtalte, dannet af ac^2 *sp.* Spikler, hvilken Form af Spikler man imidlertid ogsaa finder paa den indvendige Side af Svampen imellem de glatte ac^2 Spikler; og endelig finder man anc^2 3 Spikler i Sarkoden. Disse sidste finder man hyppigst i aflange og runde Sarkode-Klumper, stærkt farvede med Karmin, og som paa nogle Steder næsten har Udseende af at bestaa af Celler, skjønt det ikke er muligt med Vished at opdage Kjerner eller Cellerande (Tab. II, Fig. 5).

Findested.

Station 255.

Ved at henføre disse to Former til særegne Arter gjør jeg det blot paa Grund af det afvigende Udseende. Sandsynligvis vilde det være mere nøiagtigt at henføre dem til een Art.

Desmacidon.

Til denne Slægt maa de Svampe, der nu følger, formodentlig henregnes, omendskjønt Spiklerne ikke ere ganske lige i dem alle. Med Hensyn til disse Svampe er jeg ogsaa i stor Tvivl om, hvorvidt nogle bør stilles sammen under en Art, eller om de bør henføres til individuelle og personlige Arter. Da deres ydre Udseende imidlertid er saa forskjelligt som vel muligt, saa tror jeg, det er rettest foreløbigt at skjelne mellem Arter og som Artsmærker alene at bruge deres ydre Udseende, idet det er umuligt at finde nogen Forskjel i deres Bygning eller Naaleformerne

other in all directions (Pl. II, fig. 4). Similar spicules are, also, found on the internal side the sponge, situated between the smooth ac^2 spicules.

Habitat.

Stations Nos. 8, 275.

Sclerilla dura, n. sp.

An oblong, pyriform, hard sponge, with a short curved stem, and a small protuberance, on the superior extremity, without any aperture.

It is formed like the preceeding specimen. ac^2 spicules proceed longitudinally along the axis; being parallel in the middle; and radiating in fasciculi towards the periphery, which is, also, like the last mentioned, formed of ac^2 *sp.* spicules; this form of spicules is, however, also found inside the sponge, between the smooth ac^2 spicules; and finally, anc^2 3 spicules are found in the sarcode. These last are, most frequently, found in oblong and round sarcodal lumps, strongly coloured with carmine, and which, in some places, have almost the appearance of consisting of cells; although it is not possible to detect, with certainty, nuclei or cellular margins (Pl. II, fig. 5).

Habitat.

Station No. 255.

In assigning these two forms to separate species, I do so, only, on account of the diverging habit; probably it would be more correct to assign them to one species.

Desmacidon.

To this genus, the sponges which now follow must, presumably, be assigned, although the spicules are not quite similar in them all. In regard to these sponges, I am, also, in great doubt, whether several ought to be placed together under one species, or whether they ought to be assigned to individual and personal species. As, however, their external habit is as different as well can be, I have thought it best, meantime, to distinguish species, and to use as specific distinguishing feature, the external habit only, because it is impossible to find any difference in

uden for en Arts vedkommende, der foruden Ankere ogsaa har Buer og S-formede Naale.

their structure, or in the form of the spicules, except in regard to one species which has, besides anchors and bows, also, S-formed spicules.

Desmacidon clavatum, n. sp.

Et aflangt Hoved paa en rund Stilk; denne hvid, Hovedet gult (Tab. II, Fig. 11). I Stilken saavelsom i Hovedet *ac*² og *trac* Naale samt særligt i Periferien af Hovedet, men ogsaa spredt inde i samme *anc*² 6 (Tab. II, Fig. 11).

Findested.

Station 51.

Desmacidon clavatum, n. sp.

An oblong head on a round stem. The head is yellow, and the stem is white in colour (Pl. II, fig. 11). Both, in the stem and in the head, *ac*² and *trac* spicules; also, especially, in the periphery of the head, but also inside of it, *anc*² 6, spicules are found (Pl. II, fig. 11).

Habitat.

Station No. 51.

Desmacidon nucleus, n. sp.

Nøddekjernestor, brunlig Svamp med glat Overflade. Den har *trac* Naale, der krydse hinanden i alle Retninger og med sine Spidser rager ud over Overfladen. Denne er ellers dannet udelukkende af *anc*² 6 Naale, der her ligge tæt pakkede; men som ogsaa findes forresten spredt inde i Svampen (Tab. III, Fig. 1, Tab. VI, Fig. 17).

Findested.

Station 48.

Desmacidon nucleus, n. sp.

A brownish sponge, of the size of a nut kernel; with a smooth surface. It has *trac* spicules intersecting each other in all directions, and having their apices projecting beyond the surface. This is, otherwise, formed exclusively of *anc*² 6, spicules, which are, here, placed closely packed, but which, also, are found dispersed inside the sponge (Pl. III, fig. 1, Pl. VI, fig. 17).

Habitat.

Station No. 48.

Desmacidon giganteum, n. sp.

En meget stor, ca. 22cm lang Svamp, der i den nedre Del dannes af en Stilk af spiralsnoede Naale, udenpaa hvilke der findes en ca. 1mm tyk blødere Skorpe, og hvis øvre Del er noget tykkere og besat med en Masse papilleformige Udvæxter, der er tykkere for Enden end ved Basis (Tab. VII, Fig. 8).

Svampen er svagt gulfarvet. Den spiralsnoede Axe bestaar udelukkende af lange *ac*² og *trac* Naale og i den gultfarvede Skorpe ligesom i dens papilleformige Udvæxter forekommer samme Slags Naale, men af mindre Kaliber, samt *anc*² 6, ligesom hos den foregaaende fornemmelig sammenhobede i Periferien (Tab. II, Fig. 12, 13).

Desmacidon giganteum, n. sp.

A very large sponge, measuring nearly 22cm in length, and whose inferior part consists of a stem of spirally twisted spicules; outside of which, there is found a thick softish crust, about 1mm thick; but with the superior part somewhat thicker, and beset with a multitude of papilla-shaped warts whose extremities are thicker than the base (Pl. VII, fig. 8).

The sponge is pale-yellow in colour. The spirally twisted axis consists, exclusively, of long *ac*² and *trac* spicules, and in the yellow-coloured crust, as also in the papilla-formed warts, the same kind of spicules appear, but of smaller calibre; also *anc*² 6, which are, as in the preceding specimen, principally, collected together in the periphery (Pl. II, figs. 12, 13).

Findested.

Station 58, og en anden, hvis Navn er gaaet tabt.

Desmacidon arcticum, n. sp.

Et aflangt Hoved paa en temmelig tyk Stilk, Farven hvid (Tab. VI, Fig. 16). Stilken bestaar af lange *trac* og *tr*² Naale, der straaler ud i Hovedet i alle Retninger; i Hovedet en kornet, ufarvet Sarkode, i hvilken findes *anc*² 3 og *anc*² 6, samt i ringe Antal ⌒ og ∽ (Buer og S-formige Naale) (Tab. III, Fig. 2).

Findested.

Station 137.

Esperia.

Til denne Slægt tror jeg at maatte henregne de følgende Dyr, der alle har *trac* og *rut-rut* Naale, og jeg er med Hensyn til dem i den samme Forlegenhed som med de foregaaende, om jeg skal henføre dem til samme Art eller gjøre flere Arter af dem.

Paa Tab. VII, Fig. 1, 2, 3, 4, 5, 14 og 15 findes disse Formers ydre Udseende fremstillet og paa Tab. III, Fig. 6 og Tab. IV, Fig. 2 endnu to andre. Som det vil sees, er de betydeligt afvigende i sin ydre Form, men ved Undersøgelse af deres Bygning viser denne sig at være paafaldende ensformig hos dem alle, som det vil sees af Tab. III, Fig. 3, 4, 5, 6, 7 og Tab. IV, Fig. 1 og 2, idet der hos dem alle findes Straaler af Spikler, der rage ud fra en fælles Stamme, dels i Form af fine Naale, dels i Form af Blade; alle disse Naale er *trac* og i det tynde Lag af Sarkode, der ligger udenpaa disse Naalebundter og tildels inde mellem Naalene i Stammen findes *rut-rut* af noget forskjellig Størrelse hos de forskjellige Dyr, men hos alle af samme Form. Hos en enkelt er der ogsaa fundet S-formige Naale (Tab. IV, Fig. 2).

Efter dette forekommer det mig at være rettest at henføre dem alle til en Art, som jeg vil kalde

Esperia bihamatifera (Carter), Vosmaer[1].

S-formige Naale findes, som ovenfor bemærket, kun

[1] Vosmaer: The family of the Desmacidinæ. Notes from the Leyden Museum. Vol. II, 1879.

Habitat.

Station No. 58, and another station the record of which is lost.

Desmacidon arcticum, n. sp.

An oblong head, on a rather thick stem, and white in colour (Pl. VI, fig. 16). The stem consists of long *trac* and *tr*² spicules, which radiate, outwards, in all directions, in the head. In the head, there is a granular, colourless sarcode, in which *anc*² 3, and *anc*² 6, spicules appear and, also, a few ⌒ and ∽ spicules (Bows and S-formed spicules) (Pl. III, fig. 2).

Habitat.

Station No. 137.

Esperia.

To this genus, I have found myself obliged to assign the following animals, all of which have *trac* and *rut-rut* spicules, and I am in the same difficulty in regard to them, as with the preceding ones viz. whether to assign them to the same species, or form several species for them.

Upon Pl. VII, figs. 1, 2, 3, 4, 5, 14 and 15 the external habit of these forms is illustrated; and on Pl. III, fig. 6 and Pl. IV, fig. 2, still, other two forms are shown. As will be apparent, they are considerably divergent in their external habit, but on investigation of their structure, that is seen to be, remarkably, uniform in them all, as may be seen on referring to Pl. III, figs. 3, 4, 5, 6, 7 and Pl. IV, figs. 1, 2; in so far, that in all of them, rays of spicules are found, which shoot outwards from a common root, partly, in the form of slender spicules, and partly, in the form of leaves. All of these spicules are *trac* in form, and in the thin layer of sarcode which is found outside of these spicular fasciculi, and partly, also, between the spicules of the root, there are found *rut-rut* spicules, of somewhat different size in the different animals, but still having the same form in all of them. In a solitary one, there are, also, found S-formed spicules (Pl. IV, fig. 2).

It appears to me, from this, that it is best to assign the whole of them to one species, and this I will designate

Esperia bihamatifera (Carter), Vosmaer[1].

As remarked above, S-formed spicules are found only

[1] Vosmaer. The family of the Desmacidinæ. Notes from the Leyden Museum. Vol. II, 1879.

hos et Exemplar, og det er heller ikke hos alle, at der findes *rut-rut* af to Størrelser, men disses Forskjel synes mig dog at være for liden til derpaa at begrunde Artsforskjel. Skulde man benytte den ydre Form til en saadan, saa maatte helst den, der er fremstillet, Tab. III, Fig. 6, opføres som en egen Art, da den synes at afvige fra de andre derved, at der paa den tilsyneladende ikke findes Naalebundter eller Blade som hos de andre; den er skinnende hvid af Farve og har Form af et lidet elegant Bæger paa en lang, tynd Stilk. Under Mikroskopet viser det sig imidlertid, at saavel Stilken som den udvendige Flade af Bægeret er besat med korte Naalebundter. Den i Tab. IV, Fig. 2 fremstillede Form er i sin nedre Ende spindelformet opdreven og her findes udenom Axen ophobet en hel Del hvide, kugleformige Legemer, der rimeligvis er Embryoner; ialfald ser de ud, som vare de Ansamlinger af Rundceller, Embryoner i Morulastadiet.

Findested.

Et af de indfangede Dyr er fra Station 267, for de Øvriges vedkommende er Findestederne ubekjendt.

Cladorhiza abyssicola, M. Sars.

Af denne Form er der indfanget en Mængde Exemplarer, og disse er ogsaa af meget forskjelligt Udseende, som det vil sees af Tab. VII, Fig. 7, 9, 10, 11, 12 og 13, men hos alle er Spiklerne ens paa smaa Afvigelser nær, som det kan sees af Tab. IV, Fig. 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 og 16. De smaa *anc-anc* er hos alle ens, idet de for begge Ender har 5 Tænder, ikke 5 og 3, som det almindeligvis angives. Buernes Form er noget afvigende hos de forskjellige Exemplarer, som det kan sees af Figurerne, specielt Fig. 6 og 10, hvor de er smækrere og de ombøiede Ender ligesom udtrukne i længere Spidser, men dette er for ubetydelige Afvigelser til at begrunde en Artsforskjel, og heller ikke kan hertil bruges det Forhold, at hos nogle Stavnaalene er forsynede med Opdrivninger paa Midten som i Tab. IV, Fig. 4, 5 og 11. Hos et Exemplar har jeg ikke kunnet finde Buer, Tab. IV, Fig. 3, men Ankerne har den samme Form og 5 Tænder for hver Ende som ellers.*

Habitat.

Findestederne er for de fleste Exemplarers vedkommende ukjendt; de kjendte Findesteder er Station 31, 35, 40, 84, 359.

in one specimen; and neither are there found in all of them, *rut-rut* spicules of two sizes; but these divergencies, however, seem to me, to be too small, to establish from them, a difference of species. If the external habit is made use of for this purpose, then, the form illustrated in Pl. III, fig. 6, is the one which would, preferably, be presented as an individual species, as it appears to differ from the others in this, that upon it, there are, apparently, not found any spicular fasciculi, nor leaves, as in the others. It is lustrously white in colour, and is shaped like a small, handsome chalice, seated on a long slender stem. Viewed under the microscope, it is, however, seen, that both, the stem and the external leaves of the chalice, are beset with short spicular fasciculi. The form illustrated in Pl. IV, fig. 2 is fusiform at the inferior extremity, and in this situation there is seen, collected together around the axis, a large number of white spherical corpuscles; these are, presumably, embryons, at all events, they appear as if they are collections of round cells; embryons in the morular stage.

Habitat.

Station No. 267. One specimen. The record of the stations, at which the remainder of the specimens were obtained, has been lost.

Cladorhiza abyssicola, M. Sars.

Of this form, a multitude of specimens were obtained; and they are of very varying appearance, as will be evident on referring to Pl. VII, figs. 7, 9, 10, 11, 12 and 13; but in all of them, the spicules are alike, except as regards a few trifling divergencies; as may be seen in Pl. IV, figs. 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 and 16. The small *anc-anc* spicules, are similar in all of the specimens, in so far, that they have at both extremities 5 teeth, and not 5, and 3 teeth, as is, usually, stated. The form of the bows is somewhat various in the different specimens, as may be observed from the illustrations, especially figs. 6 and 10, where they are seen to be more slender, and the bent extremities to be, as it were, attenuated into long points, but this divergency is too trifling to establish a variety of species; neither can we, in addition, make use of the fact, that in some of them, the rod spicules are furnished with bulbous tumefactions in the middle, as seen in Pl. IV, figs. 4, 5 and 11. In one of the specimens, I have not been able to observe bows (Pl. IV, fig. 3), but the anchors have the same form, and 5 teeth on each extremity, as usual.

Habitat.

Stations Nos. 31, 35, 40, 84, 359. The greater part of the specimens are, however, dredged, at stations the record of which has been lost.

Geodia parva, n. sp.

En liden, ca. 4^mm lang, haard Svamp med lidt knudet og ujevn Overflade. Skorpen dannes af *Geodia*kugler af det sædvanlige Udseende; noget Osculum kan ei opdages; Svampens Centralmasse dannes af en traadet Sarkode, der næsten har Udseende af fibrillært Bindevæv, og i denne findes et ringe Antal *trac* Naale uden nogen bestemt Anordning, af hvilke enkelte rager ind i den af Kiselkugler dannede Skorpe, og desuden spredte Kiselkugler og *gl st* Naale (Tab. V, Fig. 1).

Findested.

Station ukjendt.

Pachymatisma Johnstonia, Bowerbank.

Der er fundet foruden nogle smaa Exemplarer, der i det Ydre har megen Lighed med de af Vosmaer[1] som *Isops sphäroides* og *Isops pallida* beskrevne Svampe, ogsaa meget store Exemplarer, 5—6^cm i Gjennemsnit. Ingen af dem viser imidlertid det for *Isops* karakteristiske Forhold af Oscula og Porer. Der findes talrige Oscula paa hele Overfladen, hvert Osculum omgivet af en liden Vold (Tab. IV, Fig. 15, *a*). Den ydre Skorpe er dannet af et jevntykt Lag af Kiselkugler (Fig. 15, *b*) op i hvilket der rager Naale af forskjellig Form, dels *Mta* ($\varphi = 90^0$), enkeltvis *Mtabif* (Fig. 15, *c*), dels $ac^2 f$ (Fig. 15, *d*). Mellem Kiselkuglerne findes i Overfladen smaa *gl st* (Fig. 15, *e*); saadanne findes ogsaa inde i Svampen ved Siden af større *st* (Fig. 15, *f*) og Kiselkugler i forskjellige Udviklingsstadier (Fig. 15, *g*), paa hvilke man tildels tydeligt kan se disses Opbygning af prismatiske Naale, der med Spidserne støde sammen i Centrum og vende de brede Ender ud mod Periferien (Fig. 15, *h*). Disse ydre Ender er ikke hos alle Kiselkuglerne afstumpede; paa en Del ser de afstumpede ud, naar man ser dem *en face*, men ved at betragte Randen ser man, at de ere tilspidsede (Fig. 15, *i*). Foruden de længere $ac^2 f$ Naale findes inde i Svampen korte *trac* og $tr^0 tr$ Naale (Fig. 15, *k*).

Findested.

Station ukjendt og 359.

[1] Vosmaer: Report on the Sponges dredged up in the Arctic Sea by the „Willem Barents" in the years 1878 and 1879. Niederländisches Archiv für Zoologie. Supplementband I. 1881—82.

Geodia parva, n. sp.

A small, hard sponge about 4^mm in length, with a somewhat knotted and uneven surface. The crust is formed of *Geodia* spheres, of the usual appearance. No osculum can be seen. The central substance, or mass of the sponge, is formed of a filamentous sarcode, that has almost the appearance of fibrillous connective-tissue; a small number of *trac* spicules are found in it, but without any definite arrangement, and a few of these spicules project into the crust formed by the siliceous spheres; and further, also, of scattered siliceous spheres, and *gl st* spicules (Pl. V, fig. 1).

Habitat.

No record.

Pachymatisma Johnstonia, Bowerbank.

Besides a few small specimens of sponges, which in external appearance have much similarity to those described by Vosmaer[1], as *Isops spheroides* and *Isops pallida*, some very large specimens were, also, found, measuring 5—6^cm in diameter. None of them, however, exhibit the peculiar condition of oscula, and pores, characteristic of *Isops*. Numerous oscula are found on the entire surface, each osculum being surrounded by an elevated margin (Pl. IV, fig. 15, *a*). The external crust is formed, of a uniformly thick layer of siliceous spheres (fig. 15, *b*), in which spicules of various forms project; partly *Mta* ($\varphi = 90^0$), occasionally *Mtabif* (fig. 15, *c*) and partly $ac^2 f$ (fig. 15, *d*). Between the siliceous spheres in the surface there are found, small *gl st* spicules (fig. 15, *e*). These are also found, inside the sponge, along with larger *st* spicules (fig. 15, *f*), and siliceous spheres in various stages of development (fig. 15, *g*) upon which, sometimes, may be, distinctly, seen, their structure of prismatic spicules, meeting together in the centre with their apices, and turning their broad extremities towards the periphery (fig. 15, *h*). These outer extremities are not blunted in all the siliceous spheres. In a number of them they appear blunted, if viewed *en face*, but on investigation, of the margin, they are seen to be, in reality, acuate (fig. 15, *i*). Besides the long $ac^2 f$ spicules, short *trac* and tr^0 *tr* spicules are also found (fig. 15, *k*), inside the sponge.

Habitat.

Station No. 359, and other stations, the record of which has been lost.

[1] Vosmaer. Report on the Sponges dredged up in the Arctic Sea, by the „Willem Barents", in the years 1878 and 1879. Niederländisches Archiv für Zoologie. Supplementband I. 1881—82.

Tethya cranium, Lamarck.

Flere Exemplarer, alle runde, Overfladen besat med talrige Papiller (Tab. VII. Fig. 16). Naalene findes fremstillede Tab. V, Fig. 3 og 4.

Findested.

Station 8, 323.

Tethya cranium, *var. infrequens*, **Carter.**

Den stemmer i sit Udseende og sin Bygning fuldkommen overens med *Th. cranium* (Tab. VII, Fig. 17 og 18). Den afvigende Form af *Mta* ($\varphi > 90^0$) og *Mta* ($\varphi < 90^0$) findes fremstillet Tab. V, Fig. 5, *a*, *b*. I det ene Exemplar fandtes et Embryo (Tab. V, Fig. 5, *c*), i hvilket Naalenes radiære Anordning og deres Form tydeligt sees. *Mta* ($\varphi > 90^0$) har, som det vil sees, en noget afvigende Form fra de samme Naale hos den voxne Svamp (Fig. 5, *d*), idet Armene er meget mere divergerende.

Findested.

Station 286.

Thenea muricata, (Bowerbank) Gray.

Af denne Svamp, der har faaet saa mange Navne[1], er der fanget en Masse Exemplarer og af meget forskjellig Størrelse lige fra omtrent knappenaalshovedstore til saadanne, der er 5—6cm i Gjennemsnit (Tab. VII, Fig. 19). Næsten alle de større har et tydeligt Osculum af 3—4mm's Gjennemsnit paa den øvre Flade. Den eneste Forskjel, der kan findes mellem alle disse Exemplarer, er tildels Farven, idet nogle, især de mindre, er lysere af Farve, medens de større er brungraa, og desuden Størrelsen og Taggetheden af de store *st* Naale, som det vil sees af Tab. V, Fig. 6, 7, 8 og 9.

Findested.

Stat. 1, 29, 262 286, 303, 323, og andre ukjendte.

[1] Se Vosmaer: Report etc. Pag. 5.

Tethya cranium, Lamarck.

Several specimens; all of which are round. The surface is beset with numerous papillæ (Pl. VII, fig. 16). The spicules will be found illustrated on Pl. V, figs. 3, 4.

Habitat.

Stations No.s 8, 323.

Tethya cranium, *var. infrequeus*, **Carter.**

In external appearance, and structure, this specimen quite corresponds with *Th. cranium* (Pl. VII, figs. 17, 18). The divergent form of spicules, *Mta* ($\varphi > 90^0$) and *Mta* ($\varphi < 90^0$), is seen illustrated in Pl. V, figs. 5, *a*, *b*). In one specimen an embryon was found (Pl. V, fig. 5, *c*), in which the radiating arrangement of the spicules, and their form, are, distinctly, visible. The *Mta* ($\varphi < 90^0$) has, as will be seen, a very different form from the same spicule in the adult sponge (fig. 5, *d*), in so far as, that the arms are much more divergent.

Habitat.

Station No. 286.

Thenea muricata, (Bowerbank) Gray.

Of this sponge, to which a number of designations[1] has been applied; a large number of specimens has been obtained; and of very various sizes, ranging from about a pin's head in size, up to specimens measuring 5—6cm in diameter (Pl. VII, fig. 19). Almost all the large ones have, a distinct osculum of 3—4mm diameter, seated on the superior surface. The only difference which can be found, between all these specimens is, partly, in colour, in as much as, that a few, especially the smaller ones, are lighter in colour, whilst the large ones are brownish grey, and partly, also, in the size and aculeation of the large *st.* spicules; as will be apparent on referring to the illustration Pl. V, figs. 6, 7, 8, 9.

Habitat.

Stations No.s 1, 29, 262, 286, 303, 323, and other stations, the record of which is lost.

[1] Vide. Vosmaer's Report etc. Pag. 5.

Clavellomorpha minima, n. g. n. sp.

Denne Svamp kan jeg ikke henføre til nogen bestemt Slægt og jeg maa derfor give den et eget Navn. Det er et lidet 5^{mm} langt kølleformigt Dyr af hvid Farve, eller vel rettere farveløst; dets Bygning kan sees af Tab. V, Fig. 2. Der findes ganske faa ac^2 Naale, der ligger longitudinelt anordnede saavel i den tynde Stilk som i den kølleformige Opdrivning, der er 0,5^{mm} tyk; desuden findes i denne nogle *Mta* ($\varphi = 90^0$), der ligge inde i den kølleformige Opdrivning, og endeligt er denne saavelsom Stilken fyldt af en Masse st^2.

Findested.

Station 303.

Hyalonema arcticum, n. sp.

Denne Svamp var tør ved Fordampningen af Alkoholen paa Grund af ufuldstændig Lukning af Karret, hvori den fandtes. Der er flere Exemplarer, indtil 20^{cm} lange, hule, runde Stilke af noget forskjellig Tykkelse, der i den ene Ende sidder ligesom indsænkede i en meget løs, næsten bomuldlignende Masse, se Tab. VII, Fig. 20, der fremstiller denne Ende af et af Exemplarerne, og Fig. 21, der fremstiller et Brudstykke af den bomuldlignende Masse; Farven af de tørre Exemplarer er lysgraa, temmelig nøiagtigt som Tegningens. Den haarde Stamme eller Stilk bestaar udelukkende af lange Naale som Tab. V, Fig. 10, *a* og a^1; mange af disse har en Opdrivning paa Midten, i hvilken der tydeligt sees en Deling af Axekanalen (Fig. 10, *a*). Begge Ender af disse Naale er *tr sp* (Fig. 10, *b*). I den bomuldlignende Masse findes foruden saadanne Naale ogsaa 1) meget store *ha r tr sp* (Fig. 10, *c*). 2) *ha* r^0 *sp* (Fig. 10, *d*) og 3) *ha* ($5\,r + R$ *sp*) (Fig. 10, *e*). Efter disse Naaleformer maa Svampen være en *Hyalonema*.

Findested.

Station 35.

Kalksvampe.

Af saadanne er der ogsaa indsamlet en Del Exemplarer, og tildels fra temmelig betydelige Dybder.

Clavellomorpha minima, n. g. n. sp.

I am unable to assign this sponge to any known genus, and must, therefore, establish for it a personal designation. It is a small animal, club-shape in form, and measuring 5^{mm} long. It is whitish in colour or, more correctly speaking, may be said to be colourless. Its structure is illustrated Pl. V. fig. 2. Only a very few ac^2 spicules are seen, and these are arranged longitudinally, both in the slender stem, and the club-shaped enlargement, which latter is 0.5^{mm} thick. Besides these, a few *Mta* ($\varphi = 90^0$) spicules are also found, which are placed, inside the club-shaped enlargement, and finally, both it and the stem are occupied by a multitude of st^2 spicules.

Habitat.

Station No. 303.

Hyalonema arcticum, n. sp.

This specimen was shrivelled, owing to the evaporation of the alcohol, by reason of an imperfect closing of the vessel in which it was contained. There are several specimens with hollow, round stems, of somewhat variable thickness, measuring up to 3^{cm} in length, and which at the one extremity are seated, as if depressed in a very loose, almost cotton-like substance. Pl. VII, fig. 20 illustrates this extremity in one of the specimens, and fig. 21 illustrates a fragment of the cotton-like substance. The colour of the shrivelled specimens is light-grey, and the colour is, pretty exactly, repeated in the illustration. The shrivelled trunk or stem is composed, exclusively, of long spicules, such as are illustrated in Pl. V, fig. 10, *a* and a^1. Many of them have an enlargement in the middle, in which a division of the canal of the axis is, distinctly, seen (fig. 10, *a*). Both extremities of these spicules are *tr sp* (fig. 10, *b*). In the cotton-like substance there is, in addition to these spicules, also, found; 1) very large *ha r tr sp* spicules (fig. 10, *c*); 2) *ha* r^0 *sp* spicules (fig. 10, *d*); and 3) *ha* ($5r + R.$ *sp*) (fig. 10, *e*). Judged by the form of these spicules, the specimen must be a *Hyalonema*.

Habitat.

Station No. 35.

Calcareous sponges.

Of these sponges, there has, also, been collected a number of specimens, and, in some cases, from rather considerable depths.

Ascetta primordialis, Haeckel.

Denne Svamp er fundet paa Station 35 i et mindre og et større Exemplar og paa Station 275 et stort Nardorusexemplar fastsiddende paa Røret fra *Onuphis conchylega.*

Ascetta blanca, Haeckel.

Fra en ukjendt Station 2 Exemplarer, det ene 3^{cm} langt og $1{,}4^{cm}$ bredt, det andet $1{,}4^{cm}$ langt. Naalene er større end de af Haeckel opgivne Maal, saaledes fandt jeg Basalstraalen paa en Naal $0{,}308^{mm}$ lang og de to orale Straaler 0.244^{mm}, og Naalene er kun enkeltvis stumpe for Enderne, Mesteparten har spidse Straaler.

Leucandra Egedii?, Haeckel.

Bestemmelsen af denne Svamp er usikker.

Findested.

Station 303.

Sycandra arctica, Haeckel.

Exemplarer af denne Svamp er fundet i Saltstrømmen paa 90 Favnes Dyb og paa en ukjendt Station, samt paa Station 40 og 283.

Sycandra raphanus, Haeckel.

Findested.

Station 35.

Ascetta primordialis, Haeckel.

One small, and one larger, specimen of this sponge was found, at station No. 35; and at station No. 275, a large Nardorus specimen was found, seated, firmly, on the tube of an *Onuphis conchylega.*

Ascetta blanca, Haeckel.

Of this sponge, 2 specimens were obtained at a station the record of which has been lost. The one specimen measures, 3^{cm} in length, and 1.4^{cm} in breadth; and the other specimen 1.4^{cm} in length. The spicules are larger than those mentioned by Haeckel. I found, for instance, the basal ray in a spicule, to measure 0.308^{mm} in length, and the two oral rays to measure 0.244^{mm} in length. The spicules are, only, occasionally, blunt at the extremities, and the greater number have acuate rays.

Leucandra Egedii?, Haeckel.

The classification of this sponge is uncertain.

Habitat.

Station No. 303.

Sycandra arctica, Haeckel.

The specimens of this sponge were collected, in Saltstrømmen[1], at a depth of 90 fathoms, and, also, at stations No.s 40 and 283, as also at another station, the record of which has been lost.

Sycandra raphanus, Haeckel.

Habitat.

Station No. 35.

[1] A local current confined to the middle of the Salten-fjord.

Forklaring over Figurerne.

Tab. I, Fig. 1. *Rinalda uberrima.*
— 2. *Reniera palescens.*
— 3. *Myxilla grisea.*
— 4. *Reniera inflata.*
— 5. *Reniera digitata.*
— 6. *Reniera nivea.* *a*, et enkelt Exemplar; *b*, flere Exemplarer sammen paa et tyndt Blad; *c*, Væggen af et Exemplar, svagt forstørret; *d*, samme, stærkere forstørret; *e*, en *trac* Naal; *e'*, en *tr⁰ac* Naal; *e''*, to smaa *trac* Naale fra Overfladen; *f*, af et Længdesnit af Væggen.
— 7. *Reniera infundibuliformis.*
— 8. *Reniera complicata.*
— 9. *Reniera simplex.*
— 10. *Reniera velamentosa.*
— 11. *Reniera membranacea.*
— 12. *Reniera tubulosa.*

Tab. II, Fig. 1. *Reniera dubia.*
— 2. *Myxilla exigua.*
— 3. *Suberites alveus.*
— 4. *Sclerilla arctica.*
— 5. *Sclerilla dura.*
— 5 *A*. *Reniera oblonga.*
— 6. *Suberites conica.*
— 7. *Suberites radians.*
— 8. *Rinalda uberrima.*
— 9. *Suberites glabra.*
— 10. *Suberites incrustans.*
— 11. *Desmacidon clavatum.*
— 12. *Desmacidon giganteum.*
— 13. *Desmacidon giganteum.*

Tab. III, Fig. 1. *Desmacidon nucleus.*
— 1 *A*. *Myxilla brunnea.*
— 2. *Desmacidon arcticum.*
— 3. *Esperia bihamatifera.*
— 4. do. do.

Explanation of the plates.

Pl. I, fig. 1. *Rinalda uberrima.*
— 2. *Reniera palescens.*
— 3. *Myxilla grisea.*
— 4. *Reniera inflata.*
— 5. *Reniera digitata.*
— 6. *Reniera nivea.* *a*, A single specimen. *b*, Several specimens seen together, on a thin leaf. *c*. The wall of a specimen; slightly magnified. *d*, The wall of a specimen; considerably magnified. *e*, A *trac* spicule. *e'*, A *tr⁰ac* spicule. *e''*, Two small *trac* spicules from the surface. *f*, Aspect of a longitudinal section of the wall.
— 7. *Reniera infundibuliformis.*
— 8. *Reniera complicata.*
— 9. *Reniera simplex.*
— 10. *Reniera velamentosa.*
— 11. *Reniera membranacea.*
— 12. *Reniera tubulosa.*

Pl. II, fig. 1. *Reniera dubia.*
— 2. *Myxilla exigua.*
— 3. *Suberites alveus.*
— 4. *Sclerilla arctica.*
— 5. *Sclerilla dura.*
— 5 *A*. *Reniera oblonga.*
— 6. *Suberites conica.*
— 7. *Suberites radians.*
— 8. *Rinalda uberrima.*
— 9. *Suberites glabra.*
— 10. *Suberites incrustans.*
— 11. *Desmacidon clavatum.*
— 12. *Desmacidon giganteum.*
— 13. *Desmacidon giganteum.*

Pl. III, fig. 1. *Desmacidon nucleus.*
— 1 *A*. *Myxilla brunnea.*
— 2. *Desmacidon arcticum.*
— 3. *Esperia bihamatifera.*
do. do.

Tab. III, Fig. 5. *Esperia bihamatifera.*
— 6. do. do.
— 7. do. do.

Tab. IV, Fig. 1. *Esperia bihamatifera.*
— 2. do. do.
— 3. *Cladorhiza abyssicola.*
— 4. do. do.
— 5. do. do.
— 6. do. do.
— 7. do. do.
— 8. do. do.
— 9. do. do.
— 10. do. do.
— 11. do. do.
— 12. do. do.
— 13. do. do.
— 14. do. do.
— 15. *Pachymatisma Johnstonii.* *a*, To smaa Exemplarer; *b*, af et Snit, Kiselkugleskorpen med deri opragende Naale; *c*, *c*, to *Mta* ($\varphi = 90^0$); *d*, en *ac*^{2} *sp*; *e*, *gl st*; *f*, større *st*; *g*, to *gl* fra det indre af Svampen; *h*, Kiselprismerne, der danner *gl*; *i*, et Stykke af Overfladen af en *gl*.
— 16. *Cladorhiza abyssicola* fra Hardangerfjord, begge Ender af et Anker.

Tab. V, Fig. 1. *Geodia parva.*
— 2. *Clavellomorpha minima.*
— 3. *Tethya cranium.*
— 4. do. do.
— 5. do. do. var. infrequens. *a*, *Mta* ($\varphi < 90^0$); *b*, *Mta* ($\varphi > 90^0$); *c*, et Embryo; *d*, *Mta* ($\varphi > 90^0$) fra Embryonet; *e*, et formodentligt yngre Stadium af den samme Naaleform.
— 6. *Thenea muricata.*
— 7. do. do.
— 8. do. do.
— 9. do. do.
— 10. *Hyalonema arcticum.* *a* og *a'*, to Naale fra Stilken; *b*, Enden af en saadan Naal; *c*, *ha r tr sp*; *d*, *ha r*^{0} *sp*; *e*, *ha* ($5\,r + R$ *sp*).

Tab. VI, Fig. 1. *Reniera simplex.*
— 2. *Reniera oblonga.*
— 3. *Reniera velamentosa.*
— 4. *Reniera tubulosa.*
— 5. *Myxilla brunnea.*
— 6. *Myxilla flabelliformis.*
— 7. *Reniera dubia.*
— 8. *Reniera complicata.*

Pl. III, fig. 5. *Esperia bihamatifera.*
— 6. do. do.
— 7. do. do.

Pl. IV, fig. 1. *Esperia bihamatifera.*
— 2. do. do.
— 3. *Cladorhiza abyssicola.*
— 4. do. do.
— 5. do. do.
— 6. do. do.
— 7. do. do.
— 8. do. do.
— 9. do. do.
— 10. do. do.
— 11. do. do.
— 12. do. do.
— 13. do. do.
— 14. do. do.
— 15. *Pachymatisma Johnstonii.* *a*, Two small specimens. *b*, Aspect of a section; the siliceous spherical crust with the projecting spicules. *c*, *c*, Two *Mta* ($\varphi = 90^0$) spicules. *d*, An *ac*^{2} *sp* spicule. *e*, A *gl st* spicule. *f*, A large *st* spicule. *g*, Two *gl* spicules from the interior of the sponge. *h*, The siliceous prisms forming the *gl* spicules. *i*, A portion of the surface of a *gl* spicule.
— 16. *Cladorhiza abyssicola*, from the Hardanger fjord. Both extremities of an anchor.

Pl. V, fig. 1. *Geodia parva.*
— 2. *Clavellomorpha minima.*
— 3. *Tethya cranium.*
— 4. do. do.
— 5. do. do. Var. infrequens. *a*, A *Mta* ($\varphi < 90^0$) spicule. *b*, A *Mta* ($\varphi > 90^0$) spicule. *c*, An embryon. *d*, A *Mta* ($\varphi > 90^0$) spicule on the embryon. *e*, A, presumably, earlier stage of development of the same spicular form.
— 6. *Thenea muricata.*
— 7. do. do.
— 8. do. do.
— 9. do. do.
— 10. *Hyalonema arcticum.* *a* and *a'*, Two spicules from the stem. *b*, The extremity of such a spicule. *c*, A *ha r tr sp* spicule. *d*, *ha r*^{0} *sp* spicule. *e*, A *ha* ($5\,r + R$ *sp*) spicule.

Pl. VI, fig. 1. *Reniera simplex.*
— 2. *Reniera oblonga.*
— 3. *Reniera velamentosa.*
— 4. *Reniera tubulosa.*
— 5. *Myxilla brunnea.*
— 6. *Myxilla flabelliformis.*
— 7. *Reniera dubia.*
— 8. *Reniera complicata.*

Tab. VI, Fig. 9. *Myxilla grisea.*
— 10. *Rinalda uberrima.*
— 11. *Reniera infundibuliformis.*
— 12. *Reniera membranacea.*
— 13. *Suberites incrustans.*
— 14. *Sclerilla arctica.*
— 15. *Sclerilla dura.*
— 16. *Desmacidon arcticum.*
— 17. *Desmacidon nucleus.*
— 18. *Rinalda uberrima.*

Tab. VII. Fig. 1. *Esperia bihamatifera.*
— 2. do. do.
— 3. do. do.
— 4. do. do.
— 5. do. do.
— 6. *Thecophora semisuberites.* *a, b, c,* Overgangsformer fra *Th. elongata,* Marenz, til *Th. semisuberites d, e*; *f*, *Th. ibla,* W. Thomson.
— 7. *Cladorhiza abyssicola.*
— 8. *Desmacidon giganteum.*
— 9. *Cladorhiza abyssicola.*
— 10. do. do.
— 11. do. do.
— 12. do. do.
— 13. do. do.
— 14. *Esperia bihamatifera.*
— 15. do. do.
— 16. *Tethya cranium.*
— 17. do. do. var. infrequens, Gjennemsnit.
— 18. *Tethya cranium* var. infrequens, et Stykke af Overfladen.
— 19. *Thenea muricata.*
— 20. *Hyalonema arcticum.*
— 21. do. do.

Indleveret 23. Septbr. 1884.

Pl. VI, fig. 9. *Myxilla grisea.*
— 10. *Rinalda uberrima.*
— 11. *Reniera infundibuliformis.*
— 12. *Reniera membranacea.*
— 13. *Suberites incrustans.*
— 14. *Sclerilla arctica.*
— 15. *Sclerilla dura.*
— 16. *Desmacidon arcticum.*
— 17. *Desmacidon nucleus.*
— 18. *Rinalda uberrima.*

Pl. VII, fig. 1. *Esperia bihamatifera.*
— 2. do. do.
— 3. do. do.
— 4. do. do.
— 5. do. do.
— 6. *Thecophora semisuberites.* *a, b, c, d, e,* Transition-forms from *Th. elongata,* Marenz. *f*, *Th. ibla.* W. Thomson.
— 7. *Cladorhiza abyssicola.*
— 8. *Desmacidon giganteum.*
— 9. *Cladorhiza abyssicola*
— 10. do. do.
— 11. do. do.
— 12. do. do.
— 13. do. do.
— 14. *Esperia bihamatifera.*
— 15. do. do.
— 16. *Tethya cranium.*
— 17. do. do. Var. infrequens; sectional aspect.
— 18. *Tethya cranium* Var. infrequens. Aspect of a portion of the surface.
— 19. *Thenea muricata.*
— 20. *Hyalonema arcticum.*
— 21. do. do.

Received 23rd September 1884.

Zoologiske Stationer.

(*Zoological Stations*).

Station No.	Datum. (*Date*).	Nordlig Bredde. (*North Latitude*).	Længde fra Greenwich. (*Longitude*).	Dybde. (*Depth*). Engl. Favne. (*Fathoms*).	Meter. (*Metres*).	Bundens Temperatur. (*Temperature at Bottom*). C.	Bunden.	Bottom.	Apparat. (*Apparatus*). S. Skrabe. (*Dredge*). T. Trawl. s. Svabere. (*Swabs*).
	1876								
1	Juni 3	61° 13′	6° 36′ E.	650	1189	6.°6	Sandler.	Sabulous Clay.	S.
2	(*June*) 3	61 10	6 32 E.	672	1229	6. 7	Sandler.	Sabulous Clay.	T.
4	„ 8	61 5	5 14 E.	566	1035	6. 6	Sandler, Grus, Singel.	SabulousClay, Pebbles.	T.
8	„ 9	61 0	4 49 E.	200	366	6. 6	Ler, Sand, Sten.	Clay, Sand, Stones.	S.
9	„ 20	61 30	3 37 E.	206	377	5. 9	Ler.	Clay.	T.
10	„ 21	61 41	3 19 E.	220	402	6. 0	Slik, Ler.	Ooze, Clay.	T.
18	„ 21	62 44	1 48 E.	412	753	—1. 0	Ler.	Clay.	S. T.
23	„ 23	62 52	5 50 E.						T.
25	„ 28	63 10	5 25 E.	98	179	6. 9	Sandler.	Sabulous Clay.	T. S.
26	„ 28	63 10	5 16 E.	237	433	7. 1	Sandler.	Sabulous Clay.	S.
31	„ 29	63 10	5 0 E.	417	763	—1. 0	Sandler.	Sabulous Clay.	S. T.
33	„ 30	63 5	3 0 E.	525	960	—1. 1	Ler.	Clay.	T. S.
34	Juli 1	63 5	0 53 E.	587	1073	—1. 0	Ler.	Clay.	T.
35	(*July*) 5	63 17	1 27 W.	1081	1977	—1. 0	Biloculinler.	Biloculina Clay.	S.
40	„ 18	63 22	5 29 W.	1215	2222	—1. 2	Biloculinler.	Biloculina Clay.	S. T.
48	Aug. 6	64 36	10 22 W.	299	547	—0. 3	Mørkgraat Ler.	Dark-grey Clay.	s.
51	„ 7	65 53	7 18 W.	1163	2127	—1. 1	Biloculinler.	Biloculina Clay.	S.
52	„ 8	65 47	3 7 W.	1861	3403	—1. 2	Biloculinler.	Biloculina Clay.	T.
53	„ 10	65 13	0 33 E.	1539	2814	—1. 3	Biloculinler.	Biloculina Clay.	S & T.
54	„ 12	64 47	4 24 E.	601	1099	—1. 2	Biloculinler.	Biloculina Clay.	S & T.
79	„ 21	64 48	6 32 E.	155	283	6. 9	Sandler.	Sabulous Clay.	S.
87	„ 22	64 2	5 35 E.	498	911	—1. 1	Ler.	Clay.	S.
92	„ 22	64 0	6 42 E.	178	326	7. 2	Sandholdigt Ler.	Sabulous Clay.	T.
93	„ 24	62 41	7 8 E.	158	289	6. 4	Blød Ler.	Soft Clay.	T.
		(Romsdalsfjord).							
	1877								
96	Juni 16	66 8	3 0 E.	805	1472	—1. 1	Biloculinler.	Biloculina Clay.	S.
101	(*June*) 17	65 36	8 32 E.	223	408	6. 0	Sandler.	Sabulous Clay.	S.
124	„ 19	66 41	6 59 E.	350	640	—0. 9	Grovkornet Ler.	Coarse Clay.	S. T.
137	„ 21	67 24	8 58 E.	452	827	—1. 0	Ler.	Clay.	S. T.
147	„ 22	66 49	12 8 E.	142	260	6. 2	Graat Ler.	Grey Clay.	S.
149	„ 23	67 52	13 58 E.	135	247	4. 9	Ler.	Clay.	T. S.
		(Vestfjord).							
164	„ 29	68 21	10 40 E.	457	836	—0. 7	Sandler.	Sabulous Clay.	S. T.
175	Juli 2	69 17	14 35 E.	415	759	3. 0	Ler, Smaasten.	Clay, Pebbles.	S.
176	(*July*) 3	69 18	14 33 E.	536	980	—0. 2	Ler.	Clay.	S.
177	„ 3	69 25	13 49 E.	1443	2639	—1. 2	Biloculinler.	Biloculina Clay.	S & T.
183	„ 5	69 59	6 15 E.	1710	3127	—1. 3	Biloculinler.	Biloculina Clay.	S & T.
190	„ 7	69 41	15 51 E.	870	1591	—1. 2	Sandholdig Ler.	Sabulous Clay.	T.
192	„ 7	69 46	16 15 E.	649	1187	—0. 7	Sandler.	Sabulous Clay.	S.
195	„ 16	70 55	18 38 E.	107	196	5. 1	Sten, Ler.	Stones, Clay.	S.
200	„ 17	71 25	15 41 E.	620	1134	—1. 0	Ler.	Clay.	S. T.
205	„ 18	70 51	13 3 E.	1287	2354	—1. 2	Biloculinler.	Biloculina Clay.	S.
213	„ 26	70 23	2 30 E.	1760	3219	—1. 2	Biloculinler.	Biloculina Clay.	S.
223	Aug. 1	70 54	8 24 W.	70	128	—0. 6	Graasort Sandler.	Dark-grey sabulousClay	S.
		(Jan Mayen).							
224	„ 1	70 51	8 20 W.	95	174	—0. 6	Graasort Sandler.	Dark-grey sabulousClay	S.
225	„ 2	70 58	8 4 W.	195	357	—0. 6	Graasort Sandler.	Dark-grey sabulousClay	S.
237	„ 3	70 41	10 10 W.	263	481	—0. 3	Brunt Ler, Stene.	Brown Clay, Stones.	S.
240	„ 4	69 2	11 26 W.	1004	1836	—1. 1	Biloculinler.	Biloculina Clay.	S.
248	„ 8	67 56	4 11 E.	778	1423	—1. 4	Biloculinler.	Biloculina Clay.	S.
251	„ 9	68 6	9 44 E.	634	1159	—1. 3	Ler.	Clay.	S.
252	„ 11	Vestfjord.					Ler.	Clay.	S.
253	„ 15	Skjerstadfjord.		263	481	3. 2	Ler.	Clay.	S.

Station No.	Datum. (Date).	Nordlig Bredde. (North Latitude.)	Længde fra Greenwich. (Longitude).	Dybde. (Depth). Engl. Favne. (Fathoms).	Meter. (Metres).	Bundens Temperatur. (Temperature at Bottom). C.	Bunden.	Bottom.	Apparat. (Apparatus). S. Skrabe. (Dredge). T. Trawl. s. Svabere. (Swabs).
253b	Aug. 17	Saltstrømmen.		90	165		Sten.	Stones.	S.
	1878.								
255	Juni 19	68° 12′	15° 40′ E.	341	624	6.°5	Ler.	Clay.	S.
		(Vestfjord).							
257	*(June)* 21	70 4	23 2 E.	160	293	3.9	Ler.	Clay.	S.
		(Altenfjord).							
258	„ 21	70 13	23 3 E.	230	421	4.0	Ler.	Clay.	T.
		(Altenfjord).							
260	„ 24	70 55	26 11 E.	127	232	3.5	Ler.	Clay.	S. T.
		(Porsangerfjord).							
261	„ 25	70 47	28 30 E.	127	232	2.8	Ler.	Clay.	S. T.
		(Tanafjord).							
262	„ 27	70 36	32 35 E.	148	271	1.9	Ler.	Clay.	T. S.
267	„ 29	71 42	37 1 E.	148	271	—1.4	Ler, Sten.	Clay, Stones.	S.
270	„ 30	72 27	35 1 E.	136	249	—0.0	Ler.	Clay.	S.
273	Juli 1	73 25	31 30 E.	197	360	2.2	Ler.	Clay.	S.
275	*(July)* 2	74 8	31 12 E.	147	269	—0.4	Ler.	Clay.	T.
280	„ 4	74 10	18 51 E.	35	64	1.1	Sten.	Stones.	S.
		(Beeren Eiland).							
283	„ 5	73 47	14 21 E.	767	1403	—1.4	Ler.	Clay.	S.
286	„ 6	72 57	14 32 E.	447	817	—0.8	Ler.	Clay.	T.
290	„ 7	72 27	20 51 E.	191	349	3.5	Sandler.	Sabulous Clay.	T.
295	„ 14	71 59	11 40 E.	1110	2030	—1.3	Biloculinler.	Biloculina Clay.	T.
297	„ 16	72 36	5 12 E.	1280	2341	—1.4	Biloculinler.	Biloculina Clay.	T.
303	„ 19	75 12	3 2 E.	1200	2195	—1.6	Biloculinler.	Biloculina Clay.	T.
312	„ 22	74 54	14 53 E.	658	1203	—1.2	Ler.	Clay.	T.
315	„ 22	74 53	15 55 E.	180	329	2.5	Ler, Sand.	Clay, Sand.	T.
322	„ 23	74 57	19 52 E.	21	38	0.2	Haard.	Hard.	S.
323	„ 30	72 53	21 51 E.	223	408	1.5	Ler.	Clay.	T.
326	Aug. 3	75 31	17 50 E.	123	225	1.6	Ler.	Clay.	T.
333	„ 4	76 6	13 10 E.	748	1368	—1.3	Biloculinler.	Biloculina Clay.	T.
336	„ 5	76 19	15 42 E.	70	128	0.4	Ler, Haard B.	Clay, Hard Bottom.	S.
338	„ 6	76 19	18 1 E.	146	267	—1.1	Haard.	Hard.	S.
343	„ 7	76 34	12 51 E.	743	1359	—1.2	Ler.	Clay.	T.
350	„ 8	76 26	0 29 W.	1686	3083	—1.5	Biloculinler.	Biloculina Clay.	T.
353	„ 10	77 58	5 10 E.	1333	2438	—1.4	Biloculinler.	Biloculina Clay.	T.
357	„ 12	78 3	11 18 E.	125	229	1.9	Ler.	Clay.	S.
359	„ 12	78 2	9 25 E.	416	761	0.8	Ler.	Clay.	S.
362	„ 14	79 59	5 40 E.	459	839	—1.0	Ler.	Clay.	T.
363	„ 14	80 3	8 28 E.	260	475	1.1	Ler.	Clay.	T.
366	„ 17	79 35	11 17 E.	61	112	—2.1	Ler.	Clay.	T.
„		Magdalena Bay.		37	68	—0.2			
370	„ 18	78 48	8 37 E.	109	199	1.1	Ler.	Clay.	T.
372	„ 19	78 9	14 7 E.	129	236	1.2	Ler.	Clay.	T.
		(Isfjord).							
374	„ 22	78 16	15 33 E.	60	110	0.7	Ler.	Clay.	T.
		(Advent Bay).							

PLANCHER.

PLATES.

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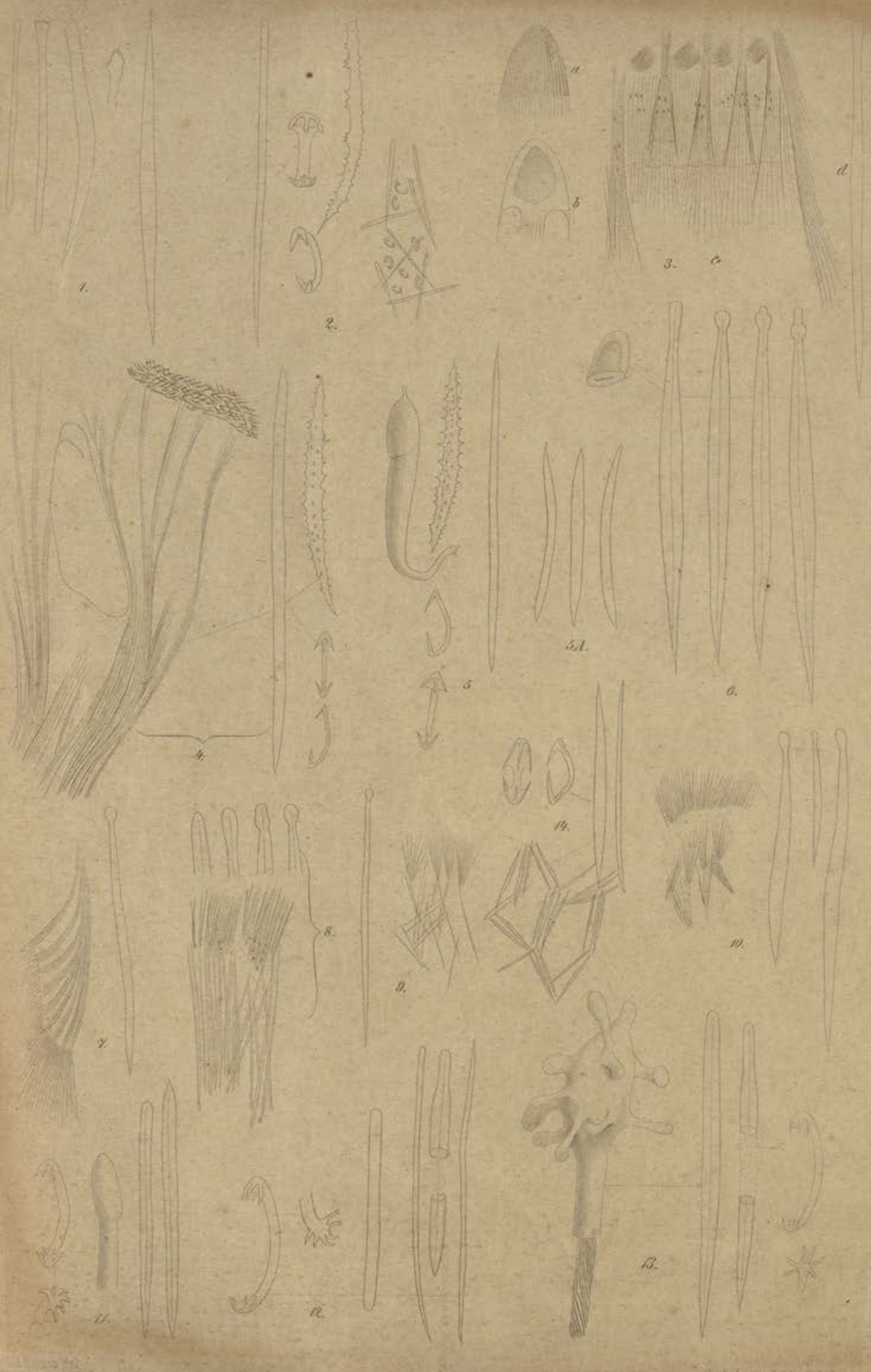
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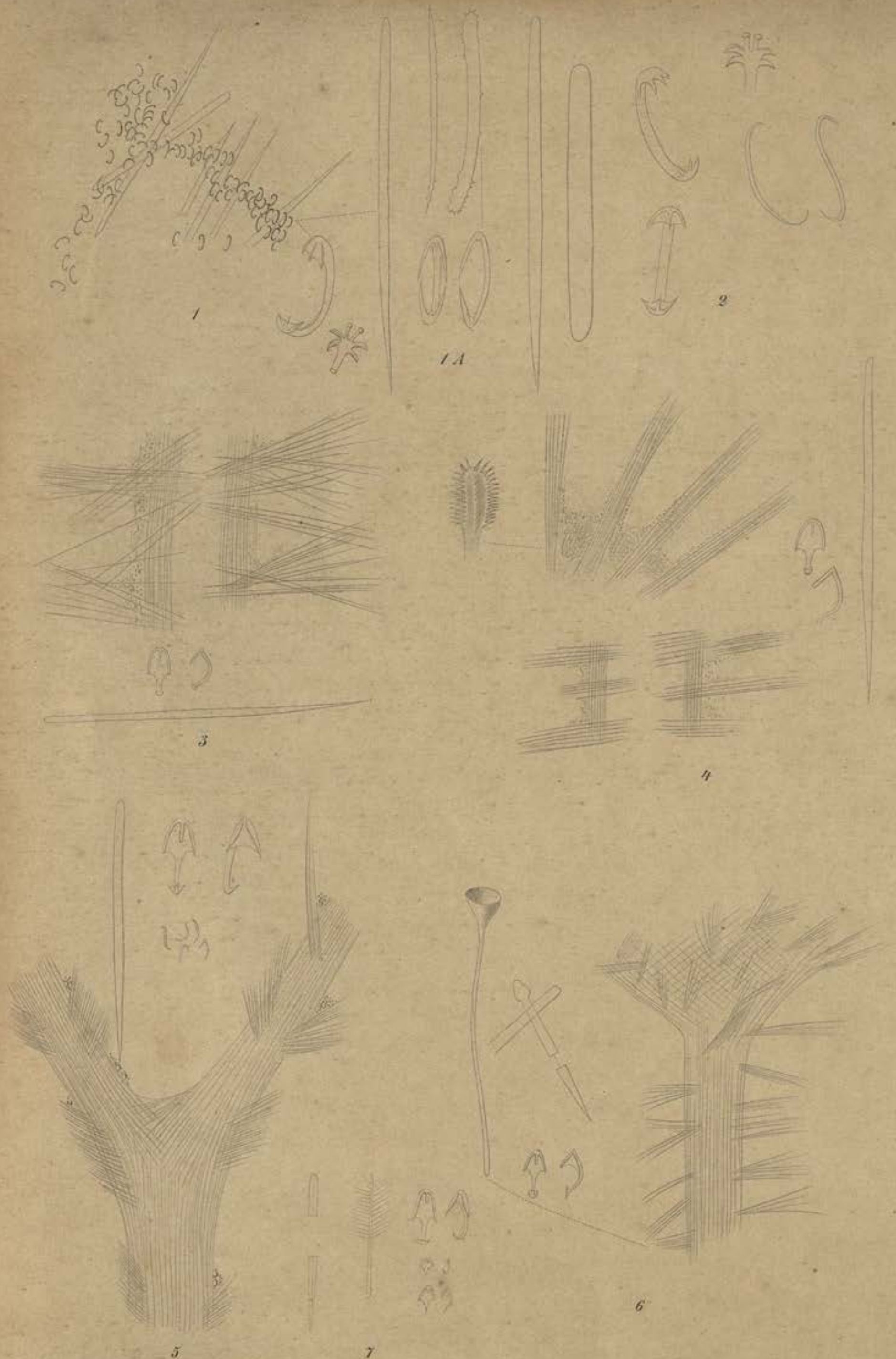

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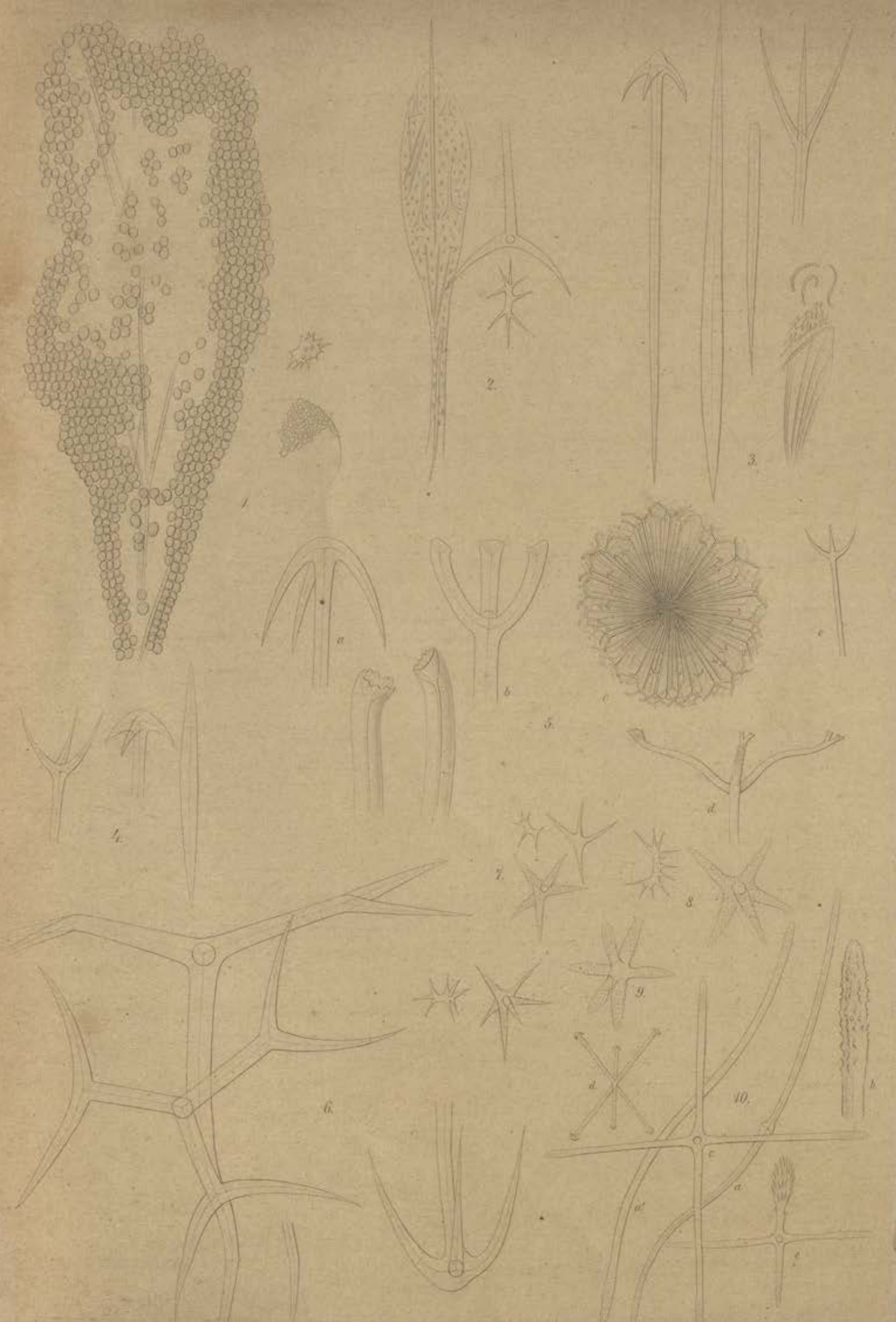

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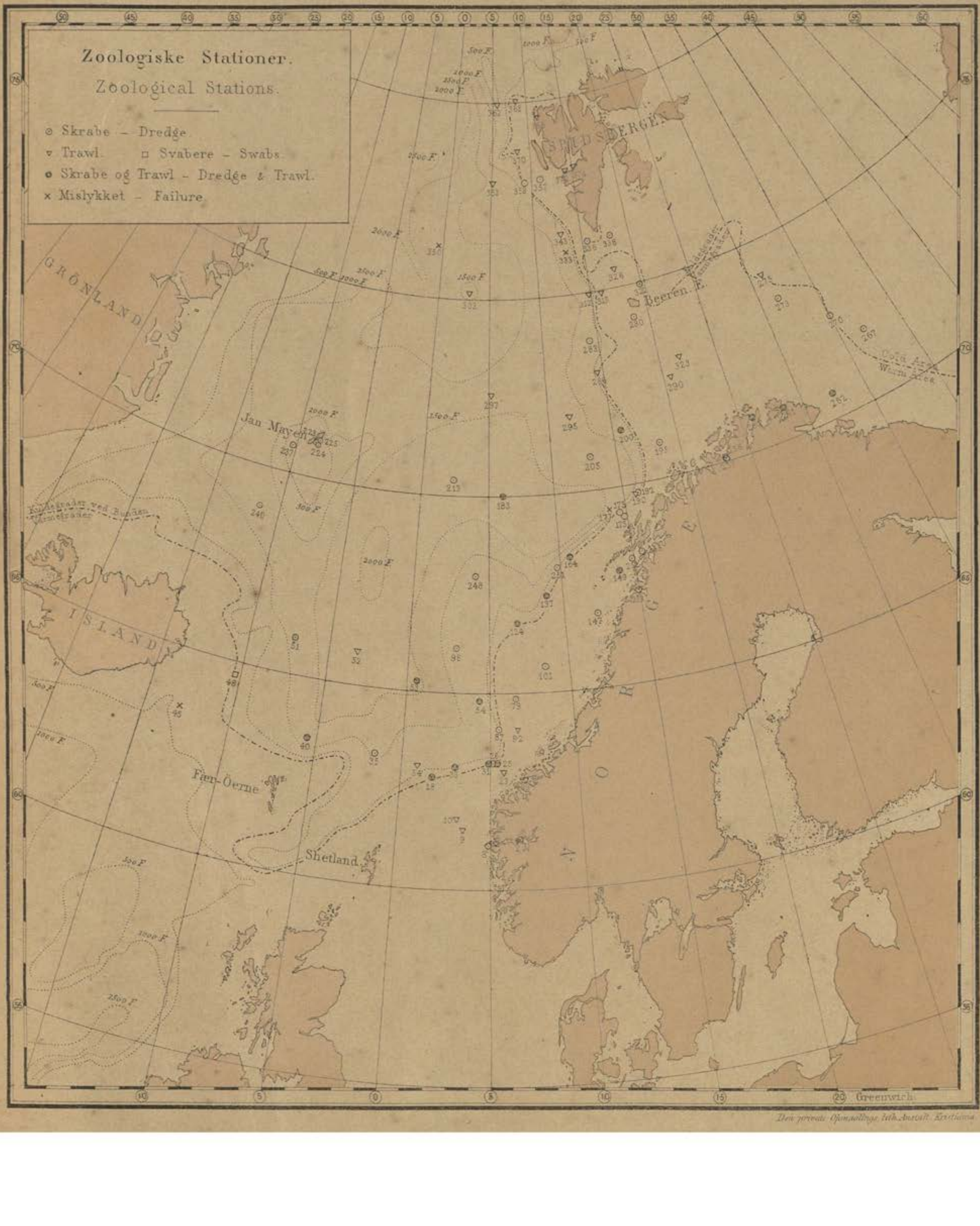

Den private Opmaalings lith. Anstalt. Kristiania.

DEN NORSKE NORDHAVS-EXPEDITION

1876—1878.

ZOOLOGI.

MOLLUSCA.

I.

BUCCINIDÆ,

VED

HERMAN FRIELE.

MED 6 PLANCHER OG 1 KART.

CHRISTIANIA.
GRØNDAHL & SØNS BOGTRYKKERI.
1882.

THE NORWEGIAN NORTH-ATLANTIC EXPEDITION
1876—1878.

ZOOLOGY.

ROYAL LIBRARY OF THE BOMBAY BRANCH OF THE ASIATIC SOCIETY

MOLLUSCA.

I.
BUCCINIDÆ,

BY

HERMAN FRIELE.

WITH 6 PLATES AND 1 MAP.

CHRISTIANIA.
PRINTED BY GRØNDAHL & SØN.
1882.

Indleveret i Januar 1881.

Før jeg gaar over til Behandlingen af det mig overdragne Materiale, skal jeg forudskikke en kort Bemærkning over den Form hvori det vil fremkomme.

Arbeidet vil blive delt i to Afdelinger. I den første behandles Alt, hvortil der kan knytte sig mere Interesse og give Anledning til flere Bemærkninger end den vertikale og horisontale Udbredelse; her vil saaledes alle de nye Former blive beskrevne og afbildede og nogle Slægter vil for de arctiske Representanters Vedkommende faa en monografisk Behandling. Den anden Afdeling kommer at indeholde en katalogisk Fortegnelse over samtlige under Expeditionens 3 Togter i 1876, 1877 og 1878 fundne Molluskarter med Angivelse af Findesteder og Dybdeforholde. En Liste over Skrabestationerne med Stedsangivelse, Dybde og Temperatur ved Havbunden vedføies og hertil refererer de ved Arterne angivne Stations Nummere. Foruden disse Skrabe-Stationer, der alle foregik fra Skibet, blev der gjort Baadskrabninger ved Reykjavik (Island), Jan Mayen, Bodø, Tromsø, Hammerfest, Norskøerne (Spitsbergen), Magdalenabay (Spitsbergen) og Adventbay (Spitsbergen).

Received January 1881.

Before recording the results of his labours in working up the materials collected on the Norwegian North-Atlantic Expedition, the author will briefly notice the form he has selected for their arrangement.

The present Memoir will consist of two sections. In the first, is comprised everything of interest not directly connected with the phenomena of vertical and horizontal distribution. There, accordingly, all the new torms have been described and figured, and a few genera, with respect to their Arctic representatives, made the subject of monographic treatment. The other section contains a Catalogue of all the Mollusca obtained on the three cruises of the Expedition, in 1876, 1877, and 1878, along with a statement of the locality and the depth in which each species was met with. A List of Dredging-Stations, with the latitude and longitude annexed, as also the depth and temperature at the bottom, is likewise given; and the numbers of Stations, noted for all the species, refer to this List. Exclusive of the zoological work prosecuted at the dredging-stations, all of which was undertaken in the open sea, dredging was also carried on from boat — at Reykjavik (Iceland), Jan Mayen, Bodø, Tromsø, Hammerfest, the Norway Islands (Spitzbergen), Magdalena Bay (Spitzbergen), and Advent Bay (Spitzbergen).

Zoologiske Stationer.
(Zoological Stations.)

Station No.	Datum. (*Date*).	Nordlig Bredde. (*North Latitude*).	Længde fra Greenwich. (*Longitude*).	Dybde. (*Depth*). Engl. Favne. (*Fathoms*).	Dybde. (*Depth*). Meter. (*Metres*).	Bundens Temperatur. (*Temperature at Bottom*). C.	Bunden.	Bottom.	Apparat. (*Apparatus*). S. Skrabe. (*Dredge*). T. Trawl. s. Svabere. (*Swabs*).
	1876								
1	Juni 3	61° 13′	6° 36′ E.	650	1189	6.°6	Sandler.	Sabulous Clay.	S.
2	(*June*) 3	61 10	6 32 E.	672	1229	6.7	Sandler.	Sabulous Clay.	T.
4	„ 8	61 5	5 14 E.	566	1035	6.6	Sandler, Grus, Singel.	Sabulous Clay, Pebbles.	T.
8	„ 9	61 0	4 49 E.	200	366	6.6	Ler, Sand, Sten.	Clay, Sand, Stones.	S.
9	„ 20	61 30	3 37 E.	206	377	5.9	Ler.	Clay.	T.
10	„ 21	61 41	3 19 E.	220	402	6.0	Slik, Ler.	Ooze, Clay.	T.
18	„ 21	62 44	1 48 E.	412	753	−1.0	Ler.	Clay.	S. T.
23	„ 23	62 52	5 50 E.						T.
25	„ 28	63 10	5 25 E.	98	179	6.9	Sandler.	Sabulous Clay.	T. S.
26	„ 28	63 10	5 16 E.	237	433	7.1	Sandler.	Sabulous Clay.	S.
31	„ 29	63 10	5 0 E.	417	763	−1.0	Sandler.	Sabulous Clay.	S. T.
33	„ 30	63 5	3 0 E.	525	960	−1.1	Ler.	Clay.	T. S.
34	Juli 1	63 5	0 53 E.	587	1073	−1.0	Ler.	Clay.	T.
35	(*July*) 5	63 17	1 27 W.	1081	1977	−1.0	Biloculinler.	Biloculina Clay.	S.
40	„ 18	63 22	5 29 W.	1215	2222	−1.2	Biloculinler.	Biloculina Clay.	S. T.
48	Aug. 6	64 36	10 22 W.	299	547	−0.3	Mørkgraat Ler.	Dark-grey Clay.	s.
51	„ 7	65 53	7 18 W.	1163	2127	−1.1	Biloculinler.	Biloculina Clay.	S.
52	„ 8	65 47	3 7 W.	1861	3403	−1.2	Biloculinler.	Biloculina Clay.	T.
53	„ 10	65 13	0 33 E.	1539	2814	−1.3	Biloculinler.	Biloculina Clay.	S & T.
54	„ 12	64 47	4 24 E.	601	1099	−1.2	Biloculinler.	Biloculina Clay.	S & T.
79	„ 21	64 48	6 32 E.	155	283	6.9	Sandler.	Sabulous Clay.	S.
87	„ 22	64 2	5 35 E.	498	911	−1.1	Ler	Clay.	S.
92	„ 22	64 0	6 42 E.	178	326	7.2	Sandholdigt Ler.	Sabulous Clay.	T.
93	„ 24	62 41	7 8 E.	158	289	6.4	Blød Ler.	Soft Clay.	T.
		(Romsdalsfjord).							
	1877								
96	Juni 16	66 8	3 0 E.	805	1472	−1.1	Biloculinler.	Biloculina Clay.	S.
101	(*June*) 17	65 36	8 32 E.	223	408	6.0	Sandler.	Sabulous Clay.	S.
124	„ 19	66 41	6 59 E.	350	640	−0.9	Grovkornet Ler.	Coarse Clay.	S. T.
137	„ 21	67 24	8 58 E.	452	827	−1.0	Ler.	Clay.	S. T.
147	„ 22	66 49	12 8 E.	142	260	6.2	Graat Ler.	Grey Clay.	S.
149	„ 23	67 52	13 58 E.	135	247	4.9	Ler.	Clay.	T. S.
		(Vestfjord).							
164	„ 29	68 21	10 40 E.	457	836	−0.7	Sandler.	Sabulous Clay.	S. T.
173b	Juli 3	69 18	14 32 E.	300	549	4.6	Ler, Sten.	Clay, Stones.	S.
175	(*July*) 2	69 17	14 35 E.	415	759	3.0	Ler, Smaasten.	Clay, Pebbles.	S.
177	„ 3	69 25	13 49 E.	1443	2639	−1.2	Biloculinler.	Biloculina Clay.	S & T.
183	„ 5	69 59	6 15 E.	1710	3127	−1.3	Biloculinler.	Biloculina Clay.	S & T.
190	„ 7	69 41	15 51 E.	870	1591	−1.2	Sandholdig Ler.	Sabulous Clay.	T.
192	„ 7	69 46	16 15 E.	649	1187	−0.7	Sandler.	Sabulous Clay.	S.
195	„ 16	70 55	18 38 E.	107	196	5.1	Sten, Ler.	Stones, Clay.	S.
200	„ 17	71 25	15 41 E.	620	1134	−1.0	Ler.	Clay.	S. T.
205	„ 18	70 51	13 3 E.	1287	2354	−1.2	Biloculinler.	Biloculina Clay.	S.
213	„ 26	70 23	2 30 E.	1760	3219	−1.2	Biloculinler.	Biloculina Clay.	S.
223	Aug. 1	70 54	8 24 W.	70	128	−0.6	Graasort Sandler.	Dark-grey, sabulous Clay	S.
		(Jan Mayen).							
224	„ 1	70 51	8 20 W.	95	174	−0.6	Graasort Sandler.	Dark-grey, sabulous Clay	S.
225	„ 2	70 58	8 4 W.	195	357	−0.6	Graasort Sandler.	Dark-grey, sabulous Clay	S.
237	„ 3	70 41	10 10 W.	263	481	−0.3	Brunt Ler, Stene.	Brown Clay, Stones.	S.
240	„ 4	69 2	11 26 W.	1004	1836	−1.1	Biloculinler.	Biloculina Clay.	S.
248	„ 8	67 56	4 11 E.	778	1423	−1.4	Biloculinler.	Biloculina Clay.	S.
251	„ 9	68 6	9 44 E.	634	1159	−1.3	Ler.	Clay.	S.
252	„ 11	Vestfjord.					Ler.	Clay.	S.
253	„ 15	Skjerstadfjord.		263	481	3.2	Ler.	Clay.	S.

Station No.	Datum. (Date).	Nordlig Bredde. (North Latitude).	Længde fra Greenwich. (Longitude).	Dybde. (Depth). Engl. Favne. (Fathoms).	Dybde. (Depth). Meter. (Metres).	Bundens Temperatur. (Temperature at Bottom). C.	Bunden.	Bottom.	Apparat. (Apparatus). S. Skrabe. (Dredge). T. Trawl. s. Svabere. (Swabs).
253b	Aug. 17	Saltstrømmen.		90	165		Sten.	Stones.	S.
	1878.								
255	Juni 19	68° 12′	15° 40′ E.	341	624	6.°5	Ler.	Clay.	S.
		(Vestfjord).							
257	(June) 21	70 4	23 2 E	160	293	3.9	Ler.	Clay.	S.
		(Altenfjord).							
258	„ 21	70 13	23 3 E.	230	421	4.0	Ler.	Clay.	T.
		(Altenfjord).							
260	„ 24	70 55	26 11 E.	127	232	3.5	Ler.	Clay.	S. T.
		(Porsangerfjord).							
261	„ 25	70 47	28 30 E.	127	232	2.8	Ler.	Clay.	S. T.
		(Tanafjord).							
262	„ 27	70 36	32 35 E.	148	271	1.9	Ler.	Clay.	T. S.
267	„ 29	71 42	37 1 E.	148	271	—1.4	Ler, Sten.	Clay, Stones.	S.
270	„ 30	72 27	35 1 E.	136	249	—0.0	Ler.	Clay.	S.
273	Juli 1	73 25	31 30 E.	197	360	2.2	Ler.	Clay.	S.
275	(July) 2	74 8	31 12 E.	147	269	—0.4	Ler.	Clay.	T.
280	„ 4	74 10	18 51 E	35	64	1.1	Sten.	Stones.	S.
		(Beeren Eiland).							
283	„ 5	73 47	14 21 E.	767	1403	—1.4	Ler.	Clay.	S.
286	„ 6	72 57	14 32 E.	447	817	—0.8	Ler.	Clay.	T.
290	„ 7	72 27	20 51 E.	191	349	3.5	Sandler.	Sabulous Clay.	T.
295	„ 14	71 59	11 40 E.	1110	2030	—1.3	Biloculinler.	Biloculina Clay.	T.
297	„ 16	72 36	5 12 E.	1280	2341	—1.4	Biloculinler.	Biloculina Clay.	T.
303	„ 19	75 12	3 2 E.	1200	2195	—1.6	Biloculinler.	Biloculina Clay.	T.
312	„ 22	74 54	14 53 E	658	1203	—1.2	Ler.	Clay.	T.
315	„ 22	74 53	15 55 E	180	329	2.5	Ler, Sand.	Clay, Sand.	T.
322	„ 23	74 57	19 52 E	21	38	0.2	Haard.	Hard.	S.
323	„ 30	72 53	21 51 E	223	408	1.5	Ler.	Clay.	T.
326	Aug. 3	75 31	17 50 E	123	225	1.6	Ler.	Clay.	T.
333	„ 4	76 6	13 10 E.	748	1368	—1.3	Biloculinler.	Biloculina Clay.	T.
336	„ 5	76 19	15 42 E.	70	128	0.4	Ler, Haard B.	Clay, Hard Bottom.	S.
338	„ 6	76 19	18 1 E.	146	267	—1.1	Haard.	Hard.	S.
343	„ 7	76 34	12 51 E.	743	1359	—1.2	Ler.	Clay.	T.
350	„ 8	76 26	0 29 W.	1686	3083	—1.5	Biloculinler.	Biloculina Clay.	T.
353	„ 10	77 58	5 10 E.	1333	2438	—1.4	Biloculinler.	Biloculina Clay.	T.
357	„ 12	78 3	11 18 E.	125	229	1.9	Ler.	Clay.	S.
359	„ 12	78 2	9 25 E.	416	761	0.8	Ler.	Clay.	S.
362	„ 14	79 59	5 40 E.	459	839	—1.0	Ler.	Clay.	T.
363	„ 14	80 3	8 28 E	260	475	1.1	Ler.	Clay.	T.
366	„ 17	79 35	11 17 E	61	112	—2.1	Ler.	Clay.	T.
„	„ „	Magdalena Bay.		37	68	—0.2			
370	„ 18	78 48	8 37 E.	109	199	1.1	Ler.	Clay.	T.
372	„ 19	78 9	14 7 E.	129	236	1.2	Ler.	Clay.	T.
		(Isfjord).							
374	„ 22	78 16	15 33 E	60	110	0.7	Ler.	Clay.	T.
		(Advent Bay).							

Buccinidæ.

Af denne Familje har Expeditionen bragt tilveie et Materiale af en ganske betydelig Størrelse, og da det er samlet under en gradvis Fremtrængen fra 60de til 80de Breddegrad og ligeledes under en stor Vidde fra Øst til Vest (fra Jan Mayen til henimod Novaja Semlja), kaster det et Lys over Arternes Variation under de forskjellige geografiske Forholde, der er af stor Interesse. De talrige levende Exemplarer har ogsaa givet en rig Anledning at undersøge den saa meget paaagtede Tandstrukturs Stabilitet. I en lille Afhandling "Ueber die Variationen der Zahnstructur bei dem Genus *Buccinum*" (Jahb. d. Mal. Ggsell. 1879) paaviste jeg, at der hos *Buccinum* ikke tør tillægges Tandformerne stor Betydning som Artskarakter. I det følgende vil det ogsaa vise sig, at inden *Neptunea* yder denne Karakter lidet tilfredsstillende Holdepunkter, men saa slemt som hos den anden Slægt er det dog ikke.

Uagtet det saaledes temmelig negative Resultat, som Undersøgelserne af Tandstrukturen har bragt til Gunst for Arterne, saa maa jeg dog indrømme denne Karakter den største Betydning for Classificationen, men før man kan gjennemføre en frugtbringende Revision med Tandstrukturen som væsentligt Grundlag, er det nødvendig at have fuld Oversigt over Formerne. Hos Familjen *Buccinidæ* er der endnu neppe nok gjort tilfredsstillende Undersøgelser til, at man med fuld Tryghed kan bevæge sig. Der er vistnok al Sandsynlighed for at flere Slægter, saasom *Troschelia* (Mørch) og *Jumala* n. gen. ikke vil beholde sin Plads under *Buccinidæ*, (hvad den første Slægt angaar, da har ogsaa Prof. G. O. Sars o. fl. udskilt den og placeret den under *Fassiolariderne;* den sidste burde da med samme Ret sættes under *Columbella* eller *Buccinopsis*), men foruden disse to er der ogsaa *Pyrolofusus, Volutopsis, Mohnia* samt en Art af *Siphonorbis,* der ikke lader sig indordne under den Ramme, som Troschel har draget for Familjen *Buccinina,* nemlig: Centralpladen 4 til 7 og Sidepladen 4 eller 3 Tænder (Gebiss d. Schnecken Vol. 2, Pg. 69); thi de har alle kun 2 Tænder paa Sidepladen og for *Mohnias*

Buccinidæ.

For the study of this family of mollusca, the Norwegian North-Atlantic Expedition has been fortunate in securing a rich collection of materials, which, obtained as it was by the gradual exploration of a tract stretching from the 60th to the 80th parallel of latitude, and east and west from the island of Jan Mayen almost to Novaja Zemlja, cannot fail, by the disclosure of many interesting data, to throw light on the varying character of the species under different biological conditions. The numerous living specimens have also furnished ample opportunity of investigating the stability of the dentition, to which attention has been so largely directed. In a brief Memoir, bearing title: — "Ueber die Variationen der Zahnstructur bei dem Genus *Buccinum*" (Jahrb. d. Mal. Gesell. 1879), I have pointed out, that but little weight, in *Buccinum*, can be attached to the structure of the teeth as a specific character. In *Neptunea*, too, as will afterwards appear, diversity of dentition affords anything but a trustworthy guide, though certainly less deceptive than in the foregoing genus.

But, negative, accordingly, upon the whole, as is the result of research touching the value of dentition in furnishing a distinct specific feature, I readily grant to that character the greatest importance in facilitating classification. Meanwhile, a thoroughgoing revision, specially founded on the structure of the teeth, implies an intimate knowledge of the forms. Now, the family *Buccinidæ* can hardly as yet have been sufficiently investigated to give a safe footing for systematical arrangement to clear up every doubtful point. Several genera, such as *Troschelia* (Mörch) and *Jumala*, n. g., will, most probably, in future, cease to rank under *Buccinidæ;* indeed, Professor G. O. Sars and other naturalists have already excluded the former, placing it under *Fassiolaridæ,* and the latter may with equal reason be classed under *Columbella* or *Buccinopsis*. Exclusive, however, of the two aforesaid genera, those of *Pyrolofusus, Volutopsis, Mohnia,* and a species of *Siphonorbis,* cannot be brought within the limits defined by Troschel for the family of *Buccinina,* viz: — the central plate with from 4 to 7 cusps, and the laterals with 4 or 3 cusps (Gebiss d. Schnecken, Vol. 2, p. 69); for they have all 2 cusps on the lateral

Vedkommedde kun 1 Tand paa Centralpladen. Slægterne *Pyrolofusus* og *Volutopsis* kunne med en vis Ret sættes under *Photina*, men derimod vil det være urimeligt at borttage *Mohnia* og *Siphonorbis undulatus* n. sp. fra *Neptunea*, thi ikke alene slutter disse sig i ydere Form til denne Slægt, men Tandstrukturen er kun en lille Modification af Slægtens Normalform, hvilket man ved at se *Neptunea (Sipho) turgidula* Tandvariationer (Tab. IV, Fig. 14—18) let kan overbevise sig om. At Familjen trænger til mere udvidede Grændser, maa være øinsynlig, men hvor disse med Rimelighed bør sættes, skal man med det for Haanden værende Materiale vanskelig kunne sige, thi det er kun de nordlige Arters Tandbygning man kjender nogenlunde tilfredsstillende.

De ægte *Neptunea* Arters Tandformer lade sig samle i 4 Grupper, nemlig:

Despecta Gruppen med Centralpladen med 3 lige store og Sidepladen med ligeledes 3 omtrent lige store Tænder. Herunder kommer *N. despecta, latericea* og *lachesis.*

Islandica Gruppen med Centralpladens Tænder vel adskilte og Sidepladen har yderste Tand størst og mellemste mindst. Herunder hører: *N. islandica, virgata, Kroyeri, curta, turrita, fusiformis* og *Danielsseni.* Den sidste gaar dog nær over til følgende.

Turgidula Gruppen med Centralpladens Tænder tæt sammenstillede, undertiden sammenvoksne, Midtanden længst, Sidepladen er som hos foregaaende. Herhen hører *N. turgidula* og *ebur.*

Mohnia Gruppen med en entandet Centralplade og totantet Sideplade. Herunder hører *N. undulata* og *N.* (Mohnia) *Mohni.*

Denne Gruppering er dog nærmest at betragte som en Rekapitulation af *Neptuneas* Tandformer. For den engere Inddeling af Slægten vil den ikke være hensigtsmæssig; thi i den Retning maa de ydre Karakterer have Fortrinet og Apex særlig og Operculum for en Del byder meget paalidelige Holdepunkter.

Hvad Apex angaar, da har Dr. Mørch givet følgende Beskrivelse af Forholdet imellem *Siphonorbis* og *Sipho* (Journ. de Conch. XXV Pg. 268): "Quand la coquille est regardée en haut, la spire formant le centre, l'ensemble de cette coquille offre l'apparence d'un Planorbe, chez les Siphonorbis, tandis qu'elle ressemble à une vessie, chez les Sipho." Med denne Karakteristik vil *Sipho* kun komme at indeslutte *Neptunea islandica* og *turgidula*, hvorimod *Siphonorbis* optager *N. gracilis, virgata, curta, Kroyeri, latericea, propinqua, turrita, lachesis, undulata, ebur, fusiformis* og *Danielsseni.* I ethvert Fald vil ikke Apex hos nogen af disse sidst nævnte Arter kunne opfattes som "une vessie." Fuldstændig regelmæssig bygget er Apex kun hos *N. propinqua* (der er Typen for Siphonorbis), *turrita, lachesis, undulata, ebur, fusiformis* og *Danielsseni;* alle de øvrige derimod er mere eller mindre uregelmæssig, og jeg har

plate, and in *Mohnia* the central plate has only 1 cusp. The genera *Pyrolofusus* and *Volutopsis* may, with some show of reason, be classed under *Photina*, whereas to exclude *Mohnia* and *Siphonorbis undulatus*, n. sp., from *Neptunea*, would be preposterous; for not only do both species agree in all external features with this genus, the structure of the teeth, too, is but slightly modified, as a glance at the varying character of the dentition in *Neptunea (Sipho) turgidula* (Pl. IV, figs. 14—18) will show. That some extension is needed of the limits set down for the family, must be obvious; but where exactly the line should be drawn, is at present difficult to decide, seeing that what comparatively accurate knowledge we have as yet obtained of the structure of the teeth refers exclusively to the northern species.

The dentition of the true *Neptunea*, may be arranged in 4 groups, viz: —

The *despecta* group, having the central plate furnished with 3 cusps of equal size, and the laterals also with 3, nearly equal in size. To this group belong *N. despecta, latericea*, and *lachesis.*

The *islandica* group, having the cusps on the central plate distinctly separate, and the laterals with the outermost cusp largest and the median smallest. To this group belong *N. islandica, virgata, Kroyeri, curta, turrita, fusiformis*, and *Danielsseni.* The latter merges, however, almost into the following.

The *turgidula* group having the cusps on the central plate, of which the median is the longest, closely arranged, sometimes grown together; the laterals as in the foregoing group. To this group belong *N. turgidula* and *N. ebur.*

The *Mohnia* group, having the central plate unidentate and the laterals bidentate. To this group belong *N. undulata* and *N. (Mohnia) Mohni.*

Such grouping, however, as the above, must be regarded chiefly as a recapitulation of the different varieties of dentition occurring in the genus *Neptunea.* They will not serve as a basis of more restricted subdivision, for which the external characters are better adapted, the operculum, and, in particular, the apex, furnishing an excellent guide.

With regard to the apex, Dr. Mörch has given the following comparative description of that character in *Siphonorbis* and *Sipho* (Journ. de Conch. XXV, p. 268: — "Quand la coquille est regardée en haut, la spire formant le centre, l'ensemble de cette coquille offre l'apparence d'un Planorbe, chez les *Siphonorbis*, tandis qu'elle ressemble à une vessie, chez les Sipho." Thus characterized, Sipho will comprise only *Neptunea islandica* and *turgidula*, whereas *N. gracilis, virgata, curta, Kroyeri, latericea, propinqua, turrita, lachesis, undulata, ebur, fusiformis*, and *Danielsseni* must be referred to *Siphonorbis.* At least, the apex in none of the latter can be regarded as "une vessie." A perfectly regular-formed apex is found only in *N. propinqua* (the type of *Siphonorbis), turrita, lachesis, undulata, ebur, fusiformis*, and *Danielsseni;* that of all the rest is more or less irregular, and hence I have not felt warranted in

derfor ikke kunnet udskille disse fra *Sipho*. En ikke uvæsentlig Ledetraad til Forstaaelsen af Apex vil man finde i Skallens Embryonal- og Ungdomsstadie.

Jumala,[1] n. gen.

(*Chrysodomus*, G. O. Sars non Swaison).

Type *Fusus Turtoni* Bean.

"*Lamellæ radulæ medianæ parvæ, quadrangulares, inermes, laterales in hamulum magnum ad marginem posticum dentibus (2) parvis armatum excurrente*". (*Sars*).

Jumala Turtoni, Bean.

Tab. IV, Fig. 4—7.

Fusus Turtoni, Bean, Ann. & Mag. N. H. Vol VIII, Pg. 491, Fig. 61.

Chrysodomus Turtoni, G. O. Sars "Moll. reg. arct norv." Pg. 269.

Forekomst: St. 255, 257, 260, 261, 290, 323 fra 127 til 341 Favne.

Prof. G. O. Sars har i ovenciterte Værk gjort opmærksom paa Radulas eiendommelige Bygning og foreslaar at optage Swainsons *Chrysodomus* som Slægtsnavn med nærværende Art som Type. Jeg er enig med Sars i den Opfatning, at en fra *Neptunea* saa afvigende Tandbygning bør have sit selvstændige Slægtsnavn, men da *Chrysodomus* er i fuld Anvendelse hinsides Atlanterhavet synonym med *Neptunea* (Bolt.), vil det neppe gaa an at benytte det og jeg foreslaar derfor *Jumala*.

Arctiske Exemplarer synes at afvige fra engelske ved en forholdsvis kortere Spir og en større mere opblæst Hovedvinding.

Arten naar ikke Spitsbergen, men dens yderste kjendte Nordgrændse ligger mellem Norge og Beeren Eiland (St. 323).

Tænderne (Tab. IV, Fig. 4—7) Centralpladen afrundet firkantet, Sidepladerne kloformede med 2 eller 3 Tænder paa indvendige Side og af disse er den inderste afstumpet og bredest.

Fig. 4 og 6 er efter forskjellige Exemplarer, der viser smaa Afvigelser i Sidepladernes Form. Fig. 7 er Sideblik af Fig. 4's Sideplade.

[1] Jumala er Navnet paa en lappisk Gud.

excluding them from *Sipho*. In judging of the apex, an accurate knowledge of the early and embryonic stages of the shell will materially assist.

Jumala,[1] n. g.

(*Chrysodomus*, G. O. Sars, non Swaison).

Type *Fusus Turtoni*, Bean.

"*Lamellæ radulæ medianæ parvæ, quadrangulares, inermes, laterales in hamulum magnum ad marginem posticum dentibus (2) parvis armatum excurrente*." (*Sars*).

Jumala Turtoni, Bean.

Pl. IV, figs. 4—7.

Fusus Turtoni, Bean, Ann. & Mag. N. H., Vol. VIII, p. 491, figs. 61.

Chrysodomus Turtoni, G. O. Sars. "Moll. reg. arct. Norv." p. 269.

Habitat: — Stats. 255, 257, 260, 261, 290, and 323; from 127 to 341 fathoms.

Professor G. O. Sars draws attention in the abovementioned work to the singular structure of the Radula, and suggests establishing Swainson's *Chrysodomus* as the generic name, with *Fusus Turtoni* as the type. I quite agree with Sars, that a dentition so widely differing from that in *Neptunea* has need of a special generic appellation; but *Chrysodomus* being universally accepted by American zoologists as synonymal with *Neptunea* (Bolt.), it will hardly do to adopt that name, in lieu of which I would propose, therefore, *Jumala*.

Arctic specimens would appear to differ from English in having a relatively shorter spire, and in the body-whorl being larger and more swollen.

This species does not reach Spitzbergen; it was met with, however, between Norway and Beeren Eiland. (Stat. 323).

Dentition (Pl. IV, figs. 4—7). Central plate rounded quadrangular; laterals ungueal, with 2 or 3 cusps on the inner side, the innermost broadest and truncate.

Figs. 4 and 6 are the laterals, from two different specimens. Fig. 7 gives a side-view of the lateral plate represented in Fig. 4.

[1] The name of a Lappish Deity.

Den af Prof. Sars (l. c. Pl. X Fig. 16) afbildede Radula tilhører ikke denne Art, men næstfølgende. Saavel Sars som jeg holdt nemlig *J. Ossiani* for kun en Varietet af *Turtoni*, da den første Gang i 1877 blev funden paa St. 124 og den af dette Exemplar udtagne Radula er det Sars har tegnet.

Jumala Ossiani,[2] Friele.

Tab. I, Fig. 1—6 og Tab. IV, Fig. 1—3.

Neptunea Ossiani, Fr. Jahrb. Mal. Gesellsch 1879 Pag. 279.

Testa J. Turtoni similis, tenuis, epidermide flavescente, scabro-hispida, sutura profunda, anfractibus 7 vel 7½ tumidis, spira producta, suprema parte cylindrica, apice retuso, laevi, subdepresso, apertura ovata, medio expansa, dimidiam testae longitudinem fere aequante, labro leviter sinuoso, columella flexuosa, canali brevi et peramplo. Superficies costis (10—12) tenuibus, elevatis, in anfractibus primariis densis, dein sensim magis distantibus, in anfractu ultimo obscuris sculpta, operculo magno, tenui elongato-pyriformi, infra sat incurvato.

Magn. long. 88 lat. 44mm, apert. long. 45, diam. max. 24mm.

Forekomst St. 124, 164, 237 (Fragm.) og 362 fra 380 til 459 Favne.

Fra *J. Turtoni* adskiller den sig ved en mindre solid Skal, en haaret Epidermis, en mere regelmæssig formet Mundaabning, en mere gradvis Aftagen af Vindingerne og en stump nedtrykt Apex (Tab. I, Fig. 3). Sculpturen bestaar hos *J. Turtoni* af flade Ribber; hos vor Art er disse derimod skarpe og mere fremtrædende.

Operculum (Fig. 2) er i sin nedre Ende bøiet.

Paa St. 164 blev en Ægkapsel med fuldt udviklet Embryon og et ungt Exemplar fundet.

Ægkapslen (Fig. 5) viser en fra foregaaende Art forskjellig Form. Den er citrongul, lang oval, noget opsvulmet og indeholder kun 1 Embryon.

Embryonet (Fig. 6 *a, b*) viser sig ogsaa afvigende fra sin Slægtning.

I Ann. & Mag. o. N. Hist. XIX Pg. 163 Pl. X Fig. 9 har Mr. Rich. Howse beskrevet Ægkapslen og Embryonet af *J. (Fusus) Turtoni*. Herefter indeholder Ægkapslen indtil 6 Embryoner af en slank cylindrisk Form.

Ungdomsstadiet (Fig. 4) er paafaldende afvigende fra

[2] Efter min Ven Prof. Dr. G. Ossian Sars. I "Jahrbücher," staar ved en Trykfejl *Neptunea Ossiania.*

The Radula figured by Professor Sars (l. c. Pl. X, fig. 16) does not belong to this, but to the following species. Both Sars and myself held *J. Ossiani*, when first met with on the cruise in 1877, at Station 124, as a mere variety of *Turtoni;* and of the Radula taken from this specimen it is that Sars made his drawing.

Jumala Ossiani,[2] Friele.

Pl. I, figs. 1—6 and Pl. IV, figs. 1—3.

Neptunea Ossiani, Fr. Jahrb. Mal. Gesell. 1879, p. 279.

Testa J. Turtoni similis, tenuis, epidermide flavescente, scabro-hispida, sutura profunda, anfractibus 7 vel 7½ tumidis, spira producta, suprema parte cylindrica, apice retuso, laevi, subdepresso, apertura ovata, medio expansa, dimidiam testae longitudinem fere aequante, labro leviter sinuoso, columella flexuosa, canali brevi et peramplo. Superficies costis (10—12) tenuibus, elevatis, in anfractibus primariis densis, dein sensim magis distantibus, in anfractu ultimo obscuris sculpta, operculo magno, tenui, elongato-pyriformi, infra sat incurvato.

Magn. long. 88, lat. 44mm, apert. long. 45, diam. max. 24mm.

Habitat: — Stats. 124, 164, 237 (fragments), and 362; from 380 to 459 fathoms.

This species differs from *J. Turtoni* in having a less substantial shell, a hispid epidermis, and an obsolete, depressed apex (Pl. I, fig. 3); the mouth, too, exhibits a more regular form, and the whorls decrease more gradually. The sculpture in *J. Turtoni* has the ribs flattened: in the species here described they are sharp and more prominent.

The *operculum* (fig. 2) has its lower extremity bent.

At Station 164 an egg-capsule, containing a fully developed embryo, and a young specimen, came up in the dredge.

The egg-capsule (fig. 5), containing only one embryo, differs in form from that of the foregoing species: it is elongato-ovate, tumid, and citron-yellow in colour.

The *embryo* (fig. 6 *a, b*), too, varies from that of its congener.

In Ann. and Mag. N. Hist., XIX, p. 163, Pl. X, fig. 9, Mr. Richard Howse has described the egg-capsule and the embryo of *J. (Fusus) Turtoni*. He found the capsule to contain as many as 6 embryos, of a slender, cylindrical form.

The young stage (fig. 4) differs widely in appearance

[2] Dedicated to my friend Professor Dr. G. Ossian Sars. In "Jahrbücher" *Neptunea Ossiania* — a misprint.

J. Turtoni ved sin forholdsvis bredere og mere regelmæssige Form og den betydelig skarpere, mere udprægede Sculptur, som i end høiere Grad kommer frem hos den Unge.

Tænderne (Tab. IV, Fig. 1—3) ligner foregaaende Arts, men Sidepladerne har en slankere Form og Tænderne paa den indvendige Side er mindre udviklet.

Rækkernes Antal hos det voksne Exemplar var omtrent 150.

Arten er udbredt lige op til 80de Breddegrad, og dens Sydgrændse blev funden ved omtrent 66°.

from that of *J. Turtoni*, by reason of its greater breadth and regularity of form, and sharper sculpture.

The *Dentition* (Pl. IV, figs. 1—3 is similar in structure to those of the foregoing species; but the laterals have comparatively a slender appearance, and the cusps on the inner side are less developed.

The number of rows in the full-grown specimen were about 150.

This species occurs as far north at the 80th parallel of latitude, and its southern limit of distribution reaches down to 66°.

Volutopsis norvegicus, Chemn.

Strombus norvagicus, Chemn., Conch. Cab. Mart. og Chemn. Pg. 218 Fig. 1497—98.
Volutopsis norvegicus, Mørch.
Stombella, gen. Gray (non Schlut).

Forekomst: St. 323—223 Favne og St. 333—146 F.

De arctiske Exemplarer synes at være mindre end Nordsøens, men forøvrigt er der intet afvigende i Form.

Paa St. 323 forekom en Ægkapsel, og denne indeholdt kun *et* Embryo.

Mr. Howse angiver i "Notes on a dredging Excursion off the coast of Durham" (l. c. Pg. 162), at *V. norvegicus* Kapsler indeholder 2 og 3 Embryoner, og dette bekræfter senere Dr. Jeffreys i "Br. Conch." Der synes saaledes at være meget ubestemte Grændser for Arternes Frugtbarhed, men man tør vel neppe af dette ene Tilfælde udlede, at Arten i det kolde Ishav viser sig mindre frugtbar end i det varmere Nordsø Vand.

Volutopsis norvegicus, Chemn.

Strombus norvegicus, Chemn., Conch. Cab. Mart. and Chemn., p. 218, figs. 1497—98.
Volutopsis norvegicus, Mörch.
Strombella, gen. Gray (non Schlut).

Habitat: — Stations 323 (223 fathoms); 333 (147 f.)

The Arctic specimens would appear to be somewhat smaller than those from the North Sea; there is, however, no dissimilarity in form.

An egg-capsule, containing only one embryo, was brought up at Station 323.

Mr. Howse states in his "Notes on a dredging Excursion off the coast of Durham," (l. c. p. 162), that the capsule of *V. norvegicus* contains from 2 to 3 embryos, in which he is confirmed by Dr. Jeffreys in "Brit. Conch." The limits of fecundity in this species seem accordingly to be very indefinite; we are, however, hardly warranted to infer from a solitary instance, that the species is less fecund in the Arctic Ocean than in the warmer waters of the North Sea.

Pyrolofusus deformis, Reeve.

Tab. 1, Fig. 8 og Tab. IV, Fig. 11—13.

Fusus deformis, Reeve. Conch icon. 1847 Vol. IV Pl. 12, Fig. 45 *a*, *b*.
Fusus (Pyrolofusus) deformis, Mørch, Cat. d. Mol. du Spitsberg Pg. 16.

Forekomst: St. 366—61 F., 2 levende Exemplarer.

Det største maaler 100^{mm} lang og 66^{mm} bred; Mundaabningen 72^{mm} lang og 38^{mm} bred.

Pyrolofusus deformis, Reeve.

Pl. I. fig. 8 and Pl. IV, figs. 11—13.

Fusus deformis, Reeve. Conch. icon. 1847, Vol. IV, Pl. 12, fig. 45 *a*, *b*.
Fusus (Pyrolofusus) deformis, Mörch, Cal. d. Mol. du. Spitsberg, p. 16.

Habitat: — Station 366 in 61 fathoms; 2 living specimens.

The larger of the two individuals measured 100^{mm} in length and 66^{mm} in breadth; the aperture was 72^{mm} long and 38^{mm} wide.

Operculum (Tab. I, Fig. 8) brungult hornagtig. Vækstlinjerne er afvekslende finere og grovere Furer, og disse krydses igjen af meget fine, uregelmæssige Striæ. Dets Størrelse er kun $^1/_3$ Del af Mundaabningens Længde.

Tænderne (Tab. IV, Fig. 11—13) viser i sin Form størst Tilnærmelse til *Photina* Troschel, ("Gebiss d. Schn." II Pag. 83 Tab. 8). Centralpladen er bred, firkantet med 3 noget fjernt fra hinanden staaende Tænder paa Skjæreranden; Sidepladerne brede, har to omtrent lige store Tænder.

Fig. 11 og 12 er efter to forskjellige Eksemplarer. Hos Fig. 11 (eller Fig. 13 i en større Maalestok) staar Centralpladens 3 Tænder regelmæssig stillet paa Skjæreranden og Mellemtanden er paafaldende mindre; hos Fig. 12 staar Tænderne derimod asymmetriske og er omtret lige store. Rækkernes Antal er omtrent 80.

Neptunea despecta, Lin.

Pl. I, Fig. 7 *a*, *b* og Pl. IV, Fig. 8—10.

Murex despectus, Lin. Syst. nat. Pg. 1222.
Fusus tornatus, Gld. Invrt. o. Massa. Pg. 286 Fig. 201.

Forekomst: St. 10, Bodø (10 F.), Tromsø (20 F.), St. 255, 261, 312, 323, 326, 357 fra 10 til 658 Favne.

var **fasciata**, nob.

Neptunea antiqua var? Kobelt. Conch. Cab. Mart. og Chmn. Vol. 3 Heft. XLIV, Pg. 104 Pl. 35 Fig. 3.
St. 286—447 Favne. Et ungt 37^{mm} stort Exemplar.

De øvre Vindinger har 3 ophøiede mørkere farvede Baand. Herr Verkrüzen har først bragt denne smukke Varietet fra Nyfoundland.

var **fornicata**, Fabr. (non Reeve).

Tritonium fornicatum, Fabr. Fauna groenl. Pg. 399.
Reykjavik 10—20 F.

I Linnés Samling (Lin. Society, London) er der blandt *Murex despectus* et Exemplar af denne Varietet fra Island.

Dr. Kobelt har i Monografien over *Neptunea* (System. Conch. Cab. Martini & Chmn.) Tab. 36 Fig. 1 givet en meget god Tegning af denne Varietet under Navn *N. antiqua* var *bicarinata* kun er Længdestriberne som Regel skarpere.

Operculum (Pl. I, fig. 8) yellowish-brown, horny. The lines of growth occur as more or less coarse grooves, intersected by exceedingly fine, irregular striæ. It measures one-third of the length of the aperture.

The *dentition* (Pl. IV, figs. 11—13) approximates closest that in *Photina* Troschel, ("Gebiss d. Schn." II, Pl. VIII, p. 83). Central plate broad, quadrangular, with three cusps somewhat distant from one other; the laterals are broad, with 2 cusps about equal in size.

Figs. 11 and 12 are of two different specimens. In fig. 11 (or fig. 13, more highly magnified) the central plate has its 3 cusps regularly arranged, and the median cusp is much the smallest; whereas in fig. 12, the cusps are asymmetrically disposed, and almost equal in size. Number of series about 80.

Neptunea despecta, Lin.

Pl. I, fig. 7 *a*, *b* and Pl. IV, figs. 8—10.

Murex despectus, Lin. Syst. nat., p. 1222.
Fusus tornatus, Gld. Invrt. o. Massa., p. 286, fig. 207.

Habitat: — Stats. 10, Bodø (10 f.), Tromsø (20 f.). Stats. 255, 261, 312, 323, 326, and 357; from 20 to 658 faths.

var **fasciata**, nob.

Neptunea antiqua var? Kobelt. Conch. Cab. Mart. and Chmn. Vol. 3, Part. XLIV, p. 104, Pl. 35, fig. 3.

Habitat: — Stat. 286 (447 f.). A young specimen, measuring 37^{mm}.

The upper whorls have 3 darkish coloured prominent bands or ribs. Herr Verkrüzen was the first to bring over this beautiful variety from Newfoundland.

var **fornicata**, Fabr. (non Reeve).

Tritonium fornicatum, Fabr. Fauna groenl., p. 399.
Reykjavik, in 10—20 fathoms.

In the Linnean Collection (Lin. Society London), there is a specimen of this variety from Iceland, labelled *Murex despectus*.

Dr. Kobelt has given in his Monograph of the genus *Neptunea* (System. Conch. Cab. Martini and Chmn.), Pl. 36, fig. 1, an excellent drawing of this variety, under the name of *N. antiqua* var. *bicarinata*, except that the longitudinal lines are as a rule more distinct.

var. **borealis**, Phil.

Fusus borealis, Phil. Abb. und Beschr. III 1850 Pg. 118, Fig. 5.
Fusus fornicatus, Reeve IV 1847 Pl. 16, Fig. 63.
Tritonium antiquum var. communis, Midd. Beitr. Malaco Ros. Pg. 131, Fig. 3—6.

Forekomst: St. 366—60 F., St. 373—30 F.

Paa St. 366 (Magdalenabay, Spitsbergen) forekom saavel den glatte knudede, som alle Overgange baade til foregaaende Varietet og til den ved den norske Kyst almindelige carinerede Form.

Middendorf har i „Beiträge Mal. Ros." og Dr. Leche i "Øfersigt öfer Novaja Semlja och Jenissej Hafsmollusker" tilfulde med Illustrationer paavist at *Neptunea borealis* Ph. gaar over i *despecta* Lin.

Ægkapslerne er vel kjendte.

Embryonet (Tab. I, Fig. 7 *a*, *b*) udtaget af Ægkapsler, funden paa St. 366 og sandsynligvis tilhørende Formen *borealis* ligner *N. antiquas*. I Kapslerne fandtes fra 3 til 7 Embryoner, men som Regel var flere deforme, hvor det større Antal var tilstede.

Tænderne (Tab. IV, Fig. 8—10) er vel kjendte fra Lovén, Troschel, Sars o. fl. De Variationer, som jeg har observeret, er gjengivet i Fig. 8, 9 og 10.

Af 7 undersøgte Exemplarer fandtes hos;

1 Explr.	3 Tænder paa Centralpladen		3 Tænder paa Sidepladerne.
2 „	3 „ - .	—	3 paa den ene do. og 4 „ „ anden do.
2 „	3 „ -	—	4 Tænder paa do.
2 „	4 „ -	—	4 — „ do.

Hos Fig. 10 viser Centralpladen sig af en ualmindelig Bredde.

Apex uregelmæssig.

Subgen **Sipho**, (Klein)

Apex uregelmæssig.

Neptunea (Sipho) islandica, Chmn.

Tab. 1, Fig. 9—12 og Tab. VI, Fig. 1—2.

Fusus islandicus, Chmn. Conch. Cab. IV Pg. IV Pg. 141, Fig. 1312, 1313.

Forekomst: St. 10, 25, 124, 192, 237, 261, 286, 312, 323 og 326 fra 90 til 658 Favne.

Arten gaar saaledes ned til en Dybde af over 650 Favne (St. 312) hvorfra 2 levende, men meget tyndskallede Exemplarer blev optaget. Dens Nordgrændse er Spitsbergen, i hvis Fauna den nu for første Gang indføres.

var. **borealis**, Phil.

Fusus borealis, Phil., Abb. und Beschr. III, 1850, p. 118, fig. 5.
Fusus fornicatus, Reeve IV, 1847, Pl. 16, fig. 63.
Tritonium antiquum var. communis, Midd. Beitr. Malaco Ros., p. 131, figs. 3—6.

Habitat: — Stats. 366 (60 fathoms) and 373 (40 f.).

At Station 366 (Magdalena Bay, Spitzbergen) occurred not only the smooth, protuberant, but all the other transition-forms, leading up alike to the foregoing and to the carinated variety common on the Norwegian coast.

Middendorf, in his "Beiträge Mal. Ros.," and Dr. Leche, in his "Øfersigt øfer Novaja Semlja och Jenissej Hafsmollusker," have shown that *Neptunea borealis,* Ph. is merged in *despecta* Lin.

The egg-capsules are well known.

The *embryos* (Pl. I, fig. 7 *a*, *b*) taken from the capsules brought up at Station 366, and most likely belonging to the variety *borealis,* resemble those of *N. antiqua*. Each capsule contained from 3 to 7 embryos; but frequently some were deformed when the larger number were present.

The *teeth* (Pl. IV, fig. 8—10) are well known from Lovén's, Troschel's, Sars's, and other zoologists' drawings. The variations observed by myself are represented in figs. 8, 9, and 10.

Of 7 individuals examined —

1 had	3 cusps on the central plate and	3 on both of the laterals.
2 „	3 - - - - - - -	3 on one of the lat., the other having 4.
2 „	3 - - - - - - -	4 on each of the lat.
2 „	4 - - - - - - -	4 - - - - -

In fig. 10, the central plate exhibits unusual breadth.

Apex irregular.

Subgen. **Sipho**, (Klein).

Apex irregular.

Neptunea (Sipho) islandica, Chmn.

Pl. I, figs. 9—12 and Pl. VI, figs. 1—2.

Fusus islandicus, Chmn., Conch. Cab. IV, p. 141, figs. 1312, 1313.

Habitat: — Stats. 10, 25, 124, 192, 237, 261, 286, 312, 323, and 326; from 90 to 658 fathoms.

This species occurs, accordingly, in upwards of 650 fathoms (Stat. 312), 2 living, but exceedingly thin-shelled specimens having been brought up from that depth. Its northern limit of distribution is Spitzbergen, in whose fauna this species now appears for the first time.

Apex (Fig. 12 *a, b, c*) er som Regel mammilliform og Nucleus dreiet til Side, men hos et Exemplar fra St. 312 er Apexdannelsen ualmindelig reglmæssig (Fig. 12 *c*), uden at det dog er synlig, at der tidligere har været en Læsion af Skallen.

Et ungt omtrent 10mm stort Exemplar er afbildet i Fig. 11 *a, b*.

Ægkapslen (Fig. 9) er halvkugleformig noget fladtrykt, rund oval, med en bred Margin, 18 til 20mm lang; Farven er gul og skinnende.

Embryonerne (Fig. 10 *a, b*) 3 til 4 i hver Kapsel, er gjennemsigtige, glindsende, kun Apex er opak hvid; Apexdannelsens Uregelmæssighed aabenbarer sig allerede her tydelig.

Tænderne (Tab. VI, Fig. 1—2) har været undersøgt hos 6 Exemplarer; men viser ingen paafaldende Variationer. Hos Sidepladerne synes Mellemtanden som Regel at staa trykket nær op mod den indre Tand.

The *apex* (fig. 12 *a, b, c*) is as a rule mammilliform, and the nucleus has a lateral twist; but in a specimen from Station 312, the structure of the apex is exceptionally regular (fig. 12 *c*), without however the shell exhibiting any trace of previous mutilation.

A young specimen, measuring about 10mm, is represented in fig. 11 *a, b*.

The *egg-capsule* (fig. 9) is hemispheric, rather depressed, roundish oval, with a broad margin, 18mm to 20mm long; colour a lustrous yellow.

The *embryos* (fig. 10 *a, b*), from 3 to 4 in each capsule, are translucent, glistening, the apex only being opaque white. The asymmetrical structure of the apex asserts itself in this early stage of development.

The *dentition* (Pl. VI, figs. 1, 2) has been examined in 6 different specimens, but did not present any striking diversity. On the laterals, the median cusp would as a rule appear to be pressed up against the inner one.

Neptunea (Sipho) turgidula, Jeffr. (M. S.).

Tab. 1, Fig. 13—18 og Tab. IV, Fig. 14—18.

Fusus turgidulus, (Jeff. M. S.) Friele, "Prelim. Report" Nyt. Mag. f. Naturvidenskab 1877 Pg. 8.

Kobelt, Jahrb. Mal. Gesell. IV Pg. 278 T. IX, Fig. 2, 3.

Forekomst: St. 18, 33, 87, 192, 286 og 323 fra 223 649 Favne.

Paa "Porcupim" Exped., hvor den først blev funden, laa dens Dybdeforekomst imellem 155 og 345 F.

Det er en vel udpræget Form, der let adskiller sig fra de nærstaaende Sipho-Arter (*islandica* og *gracilis*) ved mere bugede Vindinger, dybere Sutur, kortere Canal og en mere bøiet Columelle. Sculpturen er ogsaa eiendommelig. Paa den 2den eller 3die Vinding begynder fine, tætte Spiralstriæ, der atter paa næstsidste Vinding gaar over til grove, obsure Folde. Epidermis er glat, gul, undertiden grønlig.

Apex (Fig. 15 *a, b*) er opsvullmet og skjævbøiet, bygget noget nær som hos *N. islandica*; dog er i Regelen ikke Apex paafaldende større end den underliggende Vinding.

Operculum (Fig. 16) triangulært, hornagtig og tyndt.

Allerede som ganske Unge (Fig. 17 *a, b*) adskiller denne Art sig fra *N. islandica* ved en kortere, mere tumid Form og Apex er mere fladtrykt.

Dyret (Fig. 18) er rent hvidt, Sipho lang, Tentaklerne ligeledes lange og tilspidsede, henimod Basis sidde et Par smaa Øine. Foden er meget stor og baade længere og bredere end Skallen, foran truncat med afrundede Spidse paa Siderne, bagtil bredt afrundet. Dyret er i det Hele taget stort i Forhold til Skallen.

Tænderne (Tab. IV, Fig. 14—18): Centralpladen er læn-

Neptunea (Sipho) turgidula, Jeffr. M. S.

Pl. I, figs. 13—18 and Pl. IV, figs. 14—28.

Fusus turgidulus, (Jeff. M. S.) Friele, "Prelim. Report," Nyt. Mag. f. Naturvidenskab, 1877, p. 8.

Kobelt, Jahrb. Mal. Gesells. IV, p. 278, Pl. IV, figs. 2, 3.

Habitat: — Stats. 18, 33, 87, 192, 286, 323; from 223 to 649 fathoms.

On the "Porcupine" Expedition, it was met with in 155--345 fathoms.

A well-defined form, easily distinguished from the approximating species (*islandica* and *gracilis*) by its tumid whorls, deep suture, shorter canal, and deflected columella. The sculpturing, too, is peculiar. On the 2nd or 3d whorl commences a series of fine, closely arranged striæ, which, on the penultimate whorl, pass over into obscure, broadish folds. Epidermis smooth, yellow, sometimes greenish.

Apex (fig. 15 *a, b*) mammilliform and obliquely twisted, not unlike that of *N. islandica;* as a rule, however, the apex is not much larger than the underlying whorl.

The *Operculum* (fig. 16) is triangular, corneous, and thin.

Even in the early stages of development (fig. 17 *a, b*) this species differs perceptibly from *N. islandica*, in being shorter, more tumid in form, and in having the apex more depressed.

The *animal* (fig. 18) is pure white, has the siphon long, the tentacles, too, long and acuminate and furnished near the base with small eyes. The foot is very large, longer and broader than the shell, truncate anteriorly, with the corners blunt and rounded off posteriorly. The animal is large as compared with the shell.

Dentition (Pl. IV, figs. 14—18): — Central plate longer

gere end bred og de 3 Tænder paa Skjæreranden staa tæt sammenstillede med Midttanden længst; Sidepladerne ligne *N. islandicas.* Fig. 14 holder jeg for at være Artens Normalform, men af 6 undersøgte Exemplarer viser kun 2 denne, de øvrige 4 har Uregelmæssigheder snart i Sidepladernes, snart i Centralpladens Bygning. Et Exemplar (Fig. 16) viser hvor nær Overgangen er til *Mohnias* Tandform, idet Centralpladens Tænder forener sig til én forlænget Spids og Sidepladens Midttand voxer sammen med den indre Tand.

Rækkernes Antal varierer fra 90 til noget over 100.

than broad, and having closely disposed the 3 cusps, of which the median is the longest; the laterals resemble those in *N. islandica.* Fig. 14 represents, as I conceive, the normal character of the dentition in this species, though of 6 specimens examined only 2 were found to share it, the other 4 exhibiting divers irregularities, now in the structure of the laterals, now in that of the central plate. One example (fig. 17) shows how closely the dentition approximates that in *Mohnia,* the 3 cusps on the central plate uniting into a single elongated point, and the median cusp of the laterals growing together with the inner one.

Number of rows from 90 to upwards of 100.

Neptunea (Sipho) gracilis, dCost.

Tab. I. Fig. 19, *a, b, c.*

Buccinum gracilis, da Cost. Br. Conch. Pg. 124.
Sipho glaber, Verkr. Jahrb. Mal. Gesell. 1876, Pg. 174, Tab. 3.

Forekomst: St. 9, 23, Bodø (20 F.), 255 og 261 fra 20 til 341 Favne.

Formen *Sipho glaber* Verkruzen afviger i Grunden saa lidet fra *gracilis* at der neppe er noget andet end den brungrønne Epidermis, der skulde berettige nogen Adskillelse. Hvad Sculptur angaar, da ser jeg ingen Forskjel imellem Explr. her fra Bergen og fra Finmarken.

Apex (Fig. 19 *a, b, c*) er som Regel let at adskille fra *N. islandica,* men om end denne Karakter hører til de mest paalidelige til Bedømmelse af Arterne, saa er den dog ikke, ligesaalidt som nogen anden Karakter, absolut konstant.

Fig. 19 *c* viser en stor Tilnærmelse til *N. islandica* og der kan i det Hele taget forekomme Exemplarer, overfor hvilke man vil staa meget tvivlsomme. Fra St. 261 (Tanafjord) haves saaledes et Exemplar, som paa Grund af den slanke Form og noget skarpere Sculptur end hos *gracilis,* er bestemt for *islandica,* men Apex hører dog nærmere den første til. Dette er vistnok et sjeldent Tilfælde, og det eneste, der er forekommet mig.

Tænderne er ikke at adskille fra *N. islandica.*

Neptunea (Sipho) gracilis, d'Cost.

Pl. I, fig. 19, *a, b, c.*

Buccinum gracilis, da Cost. Br. Conch, p. 124.
Sipho glaber, Verkr. Jahrb. Mal. Gesell. 1876, p. 174, Pl. 3.

Habitat: — Stats. 9, 23, Bodø (20 f.), 255, and 261; from 20 to 341 fathoms.

The difference between the form *Sipho glaber* and *B. gracilis* is so trifling, that the brownish-green epidermis constitutes about the only feature on which to found a distinction. As regards the sculpture, I cannot detect the slightest diversity on comparing specimens from Bergen with others collected on the coast of Finmark.

The *apex* (fig. 19 *a, b, c*) may as a rule be readily distinguished from that in *N. islandica;* but, though one of the safest of specific characters, it does not prove more absolutely constant than any other character.

Fig. 19 *c* represents a close approximation to *N. islandica;* indeed, examples of *gracilis* can give rise to considerable doubt. Thus, for instance, a specimen was taken at Station 261 (Tanafjord), which, owing to its slender form and a stronger, more distinct sculpturing than in *gracilis,* has been referred to *islandica,* although the apex presents greater resemblance to that in the former species. Meanwhile, this is a rare case, nay the only one I have met with.

The dentition is not to be distinguished from that in *N. islandica.*

Neptunes (Sipho) Hanseni, Friele.

Tab. I. Fig. 20.

"Catalog Spitsb. Moll." Jahrb. Mal. Gesell. 1879, Pg. 281.

Testa tenuis, conico-fusiformis, anfractibus 5 parum convexis, fere planulatis, ad suturam angulatis, spira brevi (apice decollato), sutura parum impressa, apertura pyriformi, subexpansa, supra acuminata, columella valde flexuosa, canali brevi, aperto, reflexo. Superficies costis spiralibus, parum conspicuis, striisque incrementi numerosis scutpta, epidermide laevi, e flavescenti-brunnea, tenui nitidaque,

Magn. long. 61 lat. 35^{mm}; *apert. long. 47.5, diam. max.* 19^{mm}.

Forekomst: St. 374 (Adventbay) 60 Favne.

Der blev kun fundet et dødt, men vel vedligeholdt Exemplar.

Dens nærmeste Slægtning er sandsynligvis *N. turgidula,* hvilken den ligner hvad den korte Canal angaar, og maaske vil den vise sig at være en Varietet af denne, men med det forhaanden værende Materiale kan jeg ingen Tegn til Overgange se. I Sculptur adskiller vor Art sig ved vel grunde, men sammenlignet med *turgidula,* grove Spiralribber, der ogsaa paa Hovedvindingen kommer frem med usvækket Styrke; hos *turgidula* er de her saagodtsom forsvundne eller er gaaede over til obscure Folde; rundt den grunde Sutur gaar paa Undersiden af Vindingerne et eiendommeligt noget bredt indknebet Baand, der dog paa Hovedvindingen forsvinder. Vindingerne ere dertil flade og ikke tumide som hos *turgidula.*

Den decollerede Apex tør neppe tillægges nogen Betydning da det er det hyppigste Tilfælde, hos de arctiske Mollusker at de har Apex mere eller mindre mutileret. I flere Tilfælde har jeg observeret, at det er en omspændende Actinia, der eroderer Skallen.

Neptunea (Sipho) Hanseni, Friele.

Pl. I, fig. 20.

"Catalog Spitzb. Moll.," Jahrb. Mal. Gesell. 1879, p. 281.

Testa tenuis, conico-fusiformis, anfractibus 5 parum convexis, fere planulatis ad suturam angulatis, spira brevi (apice decollato), sutura parum impressa, apertura pyriformi, subexpansa, supra acuminata, columella valde flexuosa, canali brevi, aperto, reflexo. Superficies costis spiralibus, parum conspicuis, striisque incrementi numerosis sculpta, epidermide laevi, e flavescenti-brunnea, tenui nitidaque.

Mag. long. 61^{mm}, *lat.* 35^{mm}, *apert. long.* 47.5^{mm}, *diam. max.* 19^{mm}.

Habitat: — Stat. 374 (Advent Bay), at a depth of 60 fathoms.

Only one specimen was obtained, and that dead, but in a good state.

The nearest congener of *Neptunea Hanseni* is probably *N. turgidula,* which it resembles in having a short canal; and it may perhaps turn out to be a variety of that species, though as yet I have failed to detect any transition forms. The sculpturing in *N. Hanseni* consists of depressed, but, as compared with that in *turgidula,* coarse spiral ribs, which are equally well defined on the body-whorl, whereas in *N. turgidula* they have either almost wholly disappeared on that part of the shell, or, if not, occur as obscure folds; round the shallow suture on the lower part of the whorls, passes a peculiar angulated band, rather broad and constricted, which, however, disappears on the body-whorl. Moreover, the whorls are flattened, and not tumid as in *turgidula.*

Little, if any, importance can be attached to the decollated apex, since the great majority of arctic mollusks have the apex more or less mutilated. In several cases, I found the erosion to be the work of an Actinia, encompassing the shell.

Neptunea (Sipho) virgata, Friele.

Tab. I. Fig. 21—25 og Tab. VI, Fig. 3—4.

"Catalog Spitzb. Moll." Jahrb. Moll. Gesell. 1879, Pg. 281.

Testa fusiformi-turrita, e rubescenti flava, anfractibus 7 regulariter crescentibus, parum convexis, sutura parum impressa, apertura dimidiam testae longitudinem aequante, ovata, acuminata, columella fere recta, canali brevissimo, dilatato, apice retuso, laevi et paulum deflexo. Superficies angustis lineis impressis excarata, anfractu primario laevi, circum supremam partem anfractuum mediorum (5ti, 6ti, 7mi) plicis longitudinalibus haud conspicuis, epidermide laevi, operculo magno, pyriformi, aperturam praecludente.

Neptunea (Sipho) virgata, Friele.

Pl. I, figs. 21—25 and Pl. VI, figs. 3, 4.

"Catalog Spitzb. Moll." Jahrb. Moll. Gesell. 1879, p. 281.

Testa fusiformi-turrita, e rubescenti flava, anfractibus 7 regulariter crescentibus, parum convexis, sutura parum impressa, apertura dimidiam testae longitudinem aequante, ovata, acuminata, columella fere recta, canali brevissimo, dilatato, apice retuso, laevi et paulum deflexo. Superficies angustis lineis impressis excarata, anfractu primario laevi, circum supremam partem anfractuum mediorum (5ti, 6ti, 7mi) plicis longitudinalibus haud conspicuis, epidermide laevi, operculo magno, pyriformi, aperturam praecludente.

Magn. long. 30 lat. 13mm, apert. long. 15 diam. max. 6mm.

Forekomst: St. 124—350 F., St. 326—123 F.

Dyret (Fig. 23) er hvidt, kun Sipho og Tentaklerne blaagraa. Foden har omtrent Skallens Længde, fortil truncat, bagtil bredt afrundet, Sipho middelmaadig lang, Tentaklerne lange og spidse og Øjnene sidde noget frem paa disse paa en svag Forhøining.

Apex (Fig. 24 *a*, *b*) ligner nærmest *N. gracilis*.

Operculum (Fig. 25) er stort, lukker for Mundaabningen, piriform og noget bøiet for nedre Ende.

Denne Art staar *Sipho Verkrüzeni*, Kobelt (Jahrb. Mal. Gesell. 1876 Pg. 70 Taf. 2 Fig. 1) nær, men foruden at Spiret hos den sidste er betydelig længere, saa er ogsaa Sculpturen og Operculum væsentlig afvigende.

Mr. Robert Bell i London har havt den Godhed at sende mig en Crag Fossil under Navn *Fusus altus* S. Wood, der ligner vor Art i den Grad, at Fig. 22 næsten er et correct Billede deraf. Der findes den samme fine Spiralstriering, de ejendommelige Længdefolde og den korte Canal (Apex er desværre brudt), kun er Vindingerne noget mere tumide. S. Woods Beskrivelse af *Trophon altum* (Crag. Moll. I Pg. 47) passer godt paa "volutions convex" nær, baade paa Mr. Bells Fossil og vor recente Form, men derimod ligner hans Tegninger (l. c. T. VI Fig. 13 *a*, *b* og endnu mindre Supp. T. II Fig. 17 *a*, *b*) meget lidet.

Dersom Mr. Bells Cragfossil virkelig er S. Woods *Trophon altum*, hvad jeg ikke tør have nogen afgjørende Mening om, da jeg ikke kjender Woods Typeexemplarer, tvivler jeg ikke paa, at det af mig givne Navn *virgata* kommer at vige Plads for Woods.

Tænderne (Tab. V, Fig. 3—4) synes ikke i nogen særlig Grad at adskille sig fra *N. islandica*. Hos det ene Exemplar (Fig. 4) var der paa Centralpladen snart 2 snart 3 Tænder.

Rækkernes Antal er omkring 70.

Neptunea (Sipho) curta, Jeffr.

Tab. I, Fig. 26, Tab. II, Fig. 1—11 og Tab. VI, Fig. 5—10.

Fusus curtus, Jeffr. Br. Conch. IV (1867) Pg. 336.
" *Stimpsoni*, Mørch, Moll. Færøensis (1867) Pg. 83.
" *corneus*, Say (non Lin.).
" *islandicus*, Gld. (non Gml.).
" *Sabinii*, (Gray) Jeffr., Friele, Leche.
" *tortuosus*, E. A. Smith.
" *togatus*, Mørch, Friele, Kobelt.
" *Pfaffi*, Mørch.

Magn. long. 30mm, lat. 13mm, apert. long. 15mm diam. max. 6mm.

Habitat: — Stats. 124 (350 fathoms) and 326 (123 f.).

The *animal* (fig. 23) is white, the siphon and tentacles only being of a blue-grey tint. Foot about equal in length to shell, anterior extremity truncate, posterior extremity broadly rounded; siphon of moderate length, tentacles long and acuminate, with the eyes some distance out on a slight prominence.

The *apex* (fig. 24 *a*, *b*) has most resemblance to *N. gracilis*.

Operculum (fig. 25) large, closing the aperture, pyriform, and slightly bent at the lower extremity.

This species is nearly allied to *Sipho Verkrüzeni*, Kobelt (Jahrb. Mal. Gesell. 1876, p. 70, Pl. 2, fig. 1); but the spire in the latter is considerably longer, and the sculpture and the operculum exhibit essential deviations.

Mr. Robert Bell of London has had the kindness to send me a crag-fossil, named *Fusus altus*, S. Wood, so closely resembling *virgata*, that fig. 22 might almost serve as an accurate representation of both. The delicate striature, the peculiar longitudinal folds, and the short canal (the apex is unfortunately broken) are no less characteristic of the fossil than of the recent shell; the only difference lies in the whorls of the former being a trifle more tumescent. S. Wood's description of *Trophon altum* (Crag. Moll. I, p. 47) agrees closely, save in "volutions convex," alike with the characters of Mr. Bell's fossil and those of our recent form; his drawings, on the other hand (l. c., Pl. VI, fig. 13 *a*, *b*, and more especially in Supp. Pl. II, fig. 17 *a*, *b*), present very little resemblance to either.

Should Mr. Bell's crag-fossil really prove to be S. Wood's *Trophon altum*, on the probability of which I cannot venture to pronounce, having never seen Wood's type-specimen, the name of *virgata*, which I have given to the form, will doubtless be dropped, and that given by Wood retained in preference.

The *dentition* (Pl. VI, figs. 3, 4) would not appear to differ essentially from that in *N. islandica*. In one Radula (fig. 4), the central plate had now 2, now 3 cusps.

Number of series about 70.

Neptunea (Sipho) curta, Jeffr.

Pl. I, fig. 26, Pl. II, figs. 1—11, and Pl. VI, figs. 5—10.

Fusus curtus, Jeffr. Br. Conch. IV (1867), p. 336.
" *Stimpsoni*, Mörch, Moll. Færøensis (1867), p. 83.
" *corneus*, Say (non Lin.).
" *islandicus*, Gld. (non Gml.).
" *Sabinii*, (Gray), Jeffr., Friele, Leche.
" *tortuosus*, E. A. Smith.
" *togatus*, Mørch, Friele, Kobelt.
" *Pfaffi*, Mørch.

Forekomst: St. 33, 124, 137, 267, 270, 312, 323, 326, 363, 370 og 374 fra 60 til 658 Favne.

Synonomien er her gjort noget vidtløftig, men neppe fuldstændig, for at vise den Ramme, indenfor hvilken jeg vil have Arten forstaaet.

Hvad angaar det Navn, der bør have Prædedencen, da kan jeg med Sikkerhed ikke afgjøre dette, thi baade Mørchs og Jeffreys Forfatterskab skriver sig fra 1867.

I "Catalog der auf der Norweg. Nordmeer Exped. bei Spitzbergen gefundenen Mollusken" Pg. 280 fremsatte jeg den Paastand, at der findes alle Overgange imellem *N. togata* Mørch (*Sabinii* Jeffr.) og *curta* Jeffr. (*Stimpsoni* Mørch). De 5 Exemplarer, der er illustreret Tab. II, Fig. 1—5, vil antagelig bevise det berettigede i denne Paastand. Ved i Frankfurt af Main at faa Anledning at se en smuk Række af *N. curta*, som Herr Verkrüzen havde hjembragt fra Nyfundland, faldt den store Overensstemmelse imellem begge Former mig straks i Øjnene, og da jeg for Sammenlignings Skyld havde medbragt flere af mine Spitsbergen Exemplarer blev ogsaa Dr. Kobelt opmerksom paa at her neppe kunde foreligge 2 distincte Arter. Fig. 5 er saaledes meget lig den i System. Conch. Cabin III Pg. 105 Taf. 35 Fig. 4 og 5 afbildede *N. Stimpsoni var*, der er efter et af Verkrüzens Exemplarer.

Fig. 4 (fra St. 326 imellem Beeren Island og Spitsbergen) er en grovribbet Form, der, hvad Sculptur angaar, kommer *N. Spitzbergensis* Reeve nær, men den hos denne eiendommelig udvidede Mundaabning mangler.

Fig. 6 synes at antyde en Tilnærmelse til *N. ventricosa* Gray.

Det største Exemplar (fra St. 374 Spitzbergen) maaler 77mm lang og dog er de 3 øverste Tophvirvler borte. Den arctiske Form opnaar saaledes en Størrelse, som ikke staar tilbage for den nordamerikanske.

Dr. Jeffreys har opført som *Fusus Sabinii* Synonymer: *F. Spitzbergensis* og *turtuosus* Reeve, samt *ebur*, *togatus* og *Pfaffi* Mørch. Hvad de to sidste angaar, da er jeg enig i at slaa dem sammen med *F. Sabinii*, Jeffr., men min Opfatning af N. (*Siphonorbis*) *ebur*, Mørch er derimod betydelig afvigende, dog derom senere. Overfor Reeves Arter er jeg mere ubestemt. Dr. Jeffrys har havt den Venlighed at sende mig Reeves Type af *Fusus turtuosus* til Sammenligning, men den Karakter, som jeg havde haabet skulde give den mest paalidelige Oplysning, nemlig Apex, er desværre i en mutileret Tilstand, saa det lader sig ikke med Sikkerhed afgjøre, hvor den hører hjemme, men efter Formen af Skallen at dømme, skulde jeg nærmest tro at den tilhører N. (*Siphonorbis*) *turrita*, Sars og især tyder den indknebne dybe Canal herpaa.

Dyret (Tab. I, Fig. 26) er stort, hvidt; Foden længer og noget bredere end Skallen; Sipho lang og tyk; Tentaklerne middelmaadig lange, coniske, noget tykke ved Basis, hvor et Par smaa Øine sidde.

Apex (Tab. II, Fig. 7 *a*, *b*, *c*, *d*) er i Regelen en Smule skjævbøiet, ophøiet og første Embryonalvinding sterkt afsmallende. Dr. Mørch opfører *N. togata* og *Pfaffii* under *Siphonorbis* sammen med *ebur*. Men i Apexbygningen imel-

Habitat: — Stats. 33, 124, 137, 267, 270, 312, 323, 326, 363, 370, and 374; from 60 to 658 fathoms.

The synonymy is here given somewhat at length, though not exhaustively, to indicate the limits I would assign for the species.

As to which name has the right of priority, I have no certain means of deciding, since the authorship of both Mörch and Jeffreys dates from 1867.

In "Catalog der auf der Norweg. Nordmeer Exped. bei Spitzbergen gefundenen Mollusken," p. 280, I confidently asserted that all transition-forms between *N. togata*, Mörch, (*Sabinii*, Jeffr.) and *curta*, Jeffr. (*Stimpsoni*, Mörch), are met with. The 5 specimens represented in Pl. II, figs. 1—5, will, it is believed, show this to have been a well-founded statement. Having had, during a stay at Frankfurt on the Maine, opportunity of examining a beautiful collection of *N. curta*, which Herr Verkrüzen had brought home from Newfoundland, I was immediately struck with the remarkable agreement exhibited by the two forms, and on producing several of my Spitzbergen examples, taken with me for comparison, Dr. Kobelt felt disposed to share my views concerning the probable identity of the species, which, in his opinion too, could hardly be distinct.

Fig. 4 represents a thick-ribbed form (from Stat. 236, between Beeren Eiland and Spitzbergen), which, with regard to the sculpturing, approximates *N. Spitzbergensis*, Reeve; but the expanded mouth, peculiar to that species, is wanting.

The form represented in fig. 6 would appear to approximate *N. ventricosa*, Gray.

The largest specimen (from Stat. 374, Spitzbergen) measures 77mm in length, and yet the 3 top whorls are gone. The Arctic form attains, accordingly, a size fully equal to that of the North American.

Dr. Jeffreys has given the following synonomy of *Fusus Sabinii*, viz. *F. Spitzbergensis* and *turtuosus*, of Reeve, and *F. ebur*, *togatus*, and *Pfaffi*, of Mörch. Regarding the two latter, I, too, am quite willing to unite them with *F. Sabinii*, Jeffr.; but my opinion of *N.* (*Siphonorbis*) *ebur* is very different, respecting which I shall have more to say. As to the two species of Reeve, I am more doubtful. Dr. Jeffreys has had the kindness to send me Reeve's type-specimen of *Fusus turtuosus* for comparison; but as the apex is broken, the most reliable character is lost, and its determination must be a matter of doubt, though judging from the form of the shell and the deep, constricted canal, I am disposed to refer it to *N.* (*Siphonorbis*) *turrita*, M. Sars.

Animal (Pl. I, fig. 26) large and white; foot longer and somewhat broader than the shell; siphon long and thick; tentacles of moderate length, conical, and bearing at the base, which is rather thick, a pair of small eyes.

Apex (Pl. II, fig. 7 *a*, *b*, *c*, *d*) as a rule slightly oblique, prominent, and with the first embryonic whorl rapidly diminishing. Dr. Mörch has referred *N. togata* and *Pfaffi* to *Siphonorbis*, along with *ebur*. In the structure of the

lem de første og den sidste er der en meget væsentlig Afvigelse, hvilket viser sig bedst ved at sammenligne Detaljetegningerne af Apex hos begge Former.

Operculum (Fig. 8) er langt ovalt.

Et ganske ungt 7^{mm} stort Exemplar er gjengivet i Fig. 9 *a, b.*

Ægkapslen (Fig. 10) er gul, halvkugleformig med smal Rand, 9 à 10^{mm} bred og indeholder 2 Embryoner.

Embryonet (Fig. 11 *a, b*) er rødligt, halvgjennemsigtig, glindsende. Apex er en smule oblique.

Tænderne Tab. VI, Fig. 5—10):

Den normale Tandform (Fig. 5) har en noget bred firkantet, 3-tandet Centralplade; de 3 Tænder staa fjernet fra hinanden og den midterste er længst; Sidepladerne har 3 Tænder, hvoraf den yderste størst og den midterste mindst og staar omtrent centralt. Af denne Art er undersøgt ikke mindre end 16 levende Exemplarer og det viser sig at særlig er Centralpladen underkastet de største Variationer (Fig. 6, 7, 8 og 9). Fig. 10 er saaledes en Radula med ualmindelig fantastiske Former. Uregelmæssigheder forekommer i det Hele taget hyppig.

Rækkernes Antal varierer fra 70 til 110, ja et stort Exemplar fra Adventbay har endog 130.

Denne Art er ikke funden ved den norske Kyst.

apex, however, the two first differ very considerably from the last.

Operculum (fig. 8) ovato-elongate.

A very young specimen, measuring 7^{mm}, is represented in fig. 9 *a, b.*

The *egg-capsule* (fig. 10) is yellow, semi-globose, with a narrow margin, 9^{mm} or 10^{mm} broad; it contains 2 embryos.

Embryo (fig. 11 *a, b*) reddish, glistening, semi-translucent. The apex is slightly oblique.

The variations of the teeth are represented in Pl. VI, figs. 5—10: —

The normal dentition (fig. 5) is a somewhat broad, quadrangular, tri-cuspid central plate, with the 3 cusps— of which the median is the longest — some distance apart; the laterals also are tri-cuspid, the outermost cusp being the largest and the median, about centrally placed, the smallest. The dentition of this species has been examined in no less than 16 specimens, and it appears that the central plate is most given to vary (figs. 6, 7, 8, 9). Thus, fig. 10 represents a radula remarkably fantastic in form. Irregularities are on the whole of frequent occurrence.

Number of rows varying from 70 to 110; one large specimen from Advent Bay had even as many as 130.

This species has not been met with on the Norwegian coast.

Neptunea (Sipho) Kroyeri, Møll.[1]

Tab. II, Fig. 12—15, Tab. VI, Fig. 11—15.

Fusus Kroyeri, Møll. Ind. Moll. Groenl. (Kroyers Naturh. Tidskr.) IV; 1842—43 Pg. 88.

„ *arcticus*, Philippi Abb. og Beschr. III Pg. 119, Tab. 5 Fig. 5.

Forekomst: Norskøerne (paa Stranden) St. 366—61 F., St. 374—60 F.

Paa St. 366 (Magdalenebay Spitsbergen) forekom den i stor Mængde og ikke mindre end henimod et halvt hundrede Exemplarer kom op i en Trawl. Alle disse hører til Varieteten *β pumila* (60 til 70^{mm} lang), (Mørch, Cat. Moll. Spitzb.). Et Par Exemplarer fra St. 374 (Adventbay) hører derimod til Var. *α major*, Mørch *(l. c.)*. Det største Exemplar maaler 104^{mm}, men Tophvirvlerne er brudt.

Operculum (Fig. 12) piriform; den indre Side næsten ret, den ydre stærkt krummet nedad og indad.

Apex (Fig. 13 *a, b*) er tilspidset. Embryonalvindingen stærkt aftagende og hævet.

Det unge Exemplar (Fig. 15 *a, b*) har Apex mere stump.

[1] *Neptunea cretacea*, Reeve er utvivlsom en god Art. De fleste Forfattere forener den vistnok med *N. Kroyeri*.

Neptunea (Sipho) Kroyeri, Möll.[1]

Pl. II, figs. 12—15, Pl. VI, figs. 11—15.

Fusus Kroyeri, Möll. Ind. Moll. Groenl. (Kroyers Naturh. Tidskr.) IV; 1842—43, p. 88.

„ *arcticus*, Philippi, Abb. and Beschr. III, p. 119, Pl. V, fig. 5.

Habitat: — Norway Islands (on the beach); Stats. 366 (61 fathoms) and 374 (60 f.).

At Station 366 (Magdalena Bay, Spitzbergen) this species occurred in great abundance, as many as 50 specimens having been brought up at once in the trawl-bag. They all belong to the variety *β pumila*, from 60^{mm} to 70^{mm} in length (Mörch, Cat. Moll. Spitz.). One or two specimens from Station 374 (Advent Bay) belong to var. *α major*, Mörch *(l. c.)*. The largest specimen measures 104^{mm}, but the top whorls are broken off.

Operculum (fig. 12) pyriform, with the inner line almost straight, the outer much curved, downwards and inwards.

Apex (fig. 13 *a, b*) pointed, embryonic whorl rapidly diminishing and raised.

The young specimen (fig. 15 *a, b*) has the apex more obtuse.

[1] *Neptunea cretacea*, Reeve, is no doubt a distinct species, though most authors unite it with *N. Kroyeri*.

Ægkapslen har Mørch beskrevet i Cat. Moll. Spitzb. Pag. 15. Hertil kan kun tilføies, at den er paafaldende flad og indeholder fra 3 til 5 Embryoner.

Embryonet (Fig. 14 *a, b*) ligner nærmest *N. curta*, men Apex staar ret paa Axen og Hovedvindingen er noget mindre tumid.

Tænderne (Tab. VI, Fig. 11—15): Centralpladen er bred, firkantet med ret Skjærerand; de 3 Tænder er omtrent lige store og staa vel adskilte. Sidepladerne ligne foregaaende Arts.

Radula er undersøgt hos et meget stort Antal Exemplarer, men i Modsætning til foregaaende synes hos denne Art særlig Sidepladerne at være underkastet Variationer, dog ikke saa hyppige, naar Antallet (over 20) tages i Betragtning. De Afændringer, som er fundne, er nedlagt i Fig. 12, 13 & 14. Centralpladerne er derimod mærkelig constante og kun hos et Exemplar (Fig. 15) er der fundet Afvigelser.

Rækkernes Antal er omkring 100.

The egg-capsule has been described by Mörch in Cat. Moll. Spitzb., p. 15. It is, I may add, remarkably flat, and contains from 3 to 5 embryos.

The *embryo* (fig. 14 *a, b*) resembles most that of *N. curta;* the apex, however, is straight and the body-whorl a little less tumid.

Dentition (Pl. VI, figs. 11—15): — Central plate broad, quadrangular, with straight incisory margin, its 3 cusps about equal in size and distinctly separated; laterals as in preceding species.

The radula has been examined in a great many specimens (upwards of 20); in this species, however, it would appear to be more especially the laterals that exhibit modifications of structure, though not with frequence considering the number of specimens. The diversity observed is shown in figs. 12, 13, 14. The central plate, on the other hand, proves remarkably constant; in one specimen only (fig. 15) could any modification be detected.

Number of series about 100.

Neptunea (Sipho) latericea, Møll.

Tab. II, Fig. 16, 17, Tab. VI, Fig. 16.

Fusus latericeus, Møll. Ind. Moll. Groenl. 1842, Pag. 88.
— *pellucidus,* Hanck. Ann. & Mag. 1846, Pag. 330. Pl. V, Fig. 3.
Tritonium incarnatum, M. Sars. Nyt Mag. for Naturv. 1850, Pag. 191.

Forekomst: St. 192, 326, 338, 357 og Hammerfest fra 20 til 649 Favne.

Var. *lævis,* Mørch, forekom paa Stat. 192 og 338; paa det første Sted (649 Favne) i et gammelt, dødt Expl.

Fig. 16 repræsenterer et ungt Exemplar.

Apex (Fig. 17 *a, b*) ligner *N. Kroyeri,* men er noget mere stump.

Tænderne (Pl. VI, Fig. 16) ligne *Neptunea despectas,* kun er Centralpladens Skjærerand mere bøiet. Hos 8 undersøgte Exemplarer fandtes ingen Afvigelser. Rækkernes Antal er fra 120 til 130.

Neptunea (Sipho) latericea, Möll.

Pl. II, figs. 16, 17, Pl. VI, fig. 16.

Fusus latericeus, Möll., Ind. Moll. Groenl. 1842, p. 88.
— *pellucidus,* Hanck., Ann. & Mag. 1846, p. 330, Pl. V, fig. 3.
Tritonium incarnatum, M. Sars. Nyt Mag. for Naturv. 1850, p. 191.

Habitat: — Stats. 192, 326, 338, 357, and Hammerfest; from 20 to 649 fathoms.

Var. *lævis,* Mörch, occurred at Stations 192 and 338; but in the first locality (649 faths.) only an old, dead specimen.

Fig. 16 represents the young one.

Apex (fig. 17 *a, b*) resembling that in *N. Kroyeri,* but somewhat more obtuse.

Structure of Teeth (Pl. VI, fig. 16) as in *Neptunea despecta,* saving that the incisory margin of the central plate is a little more bent. In 8 specimens examined there were no modifications. Number of series from 120 to 130.

Subgen. **Siphonorbis,** Mørch.

Apex nedtrykt, Embryonalvindingerne regelmæssig aftagende, angigyr.

Subgen. **Siphonorbis,** Mörch.

Apex depressed, embryonic whorls gradually diminishing; angigyrous.

Neptunea (Siphonorbis) ebur, Mørch.

Pl. II, Fig. 20—23, Pl. V, Fig. 1—3.

Fusus (Siphonorbis) ebur, Mørch. Journ. d. Conch. 1869, Pag. 398.
Trophon Sarsii, Jeffr., S. Wood. Supp. to the Crag Moll. (1872) Pag. 25, Pl. I, Fig. 9.
Fusus Moebi Duncker & Metzger. Exped. zur Unters. d. Nordsee, 1875, Pag. 260, Tab. VI, Fig. 1.
Fusus ebur, (Mørch), Friele, Prelim. Rep. Nyt Mag. XXIII, 1877, Pag. 7.

Forekomst: St. 25, 261, 290 og 323; fra 90 til 223 Favne.

Denne Mørchs Art har været meget omdisputeret, og Dr. Jeffreys holder den for at være en af *N. curtas* (Fusus Sabinii) mange Synonymer. Ved direkte Sammenligninger med Mørchs Type, som Prof. Dr. Steenstrup godhedsfuldt har laant mig, har jeg overtydet mig om, at disse to Arter har intet med hinanden at gjøre, og Fig. 20 er meget nær den typiske Form af *Siphonorbis ebur* (Typen har et noget længere Spir).

Foruden den for Underslægten eiendommelig nedtrykte, fuldstændig regelmæssige Apex ("Spira apice angigyro, impresso," Mørch) saa er den korte brede Kanal, der giver Skallen mere Udseende af en *Buccinum*, en iøinefaldende Karakter for Arten. At der er opstaaet Sammenblandinger af denne og den dog saa fjernt staaende *N. curta* har Mørch selv Skyld i; thi hans samtidige Diagnoser af *N. ebur* og *togata* adskiller sig saa lidet fra hinanden, at man har Grund at tro, at det kun er to smaa Formafvigelser, man har for sig. Det Exemplar af *N. ebur*, hvorefter Mørch har givet Beskrivelsen, er udtaget af en Fiskemave, er derfor slidt og har Læben temmelig beskadiget. Man skulde tro, at det er Forsigtighed, der har dikteret den saa lidet tilfredsstillende Diagnose. Og dog er der ved Sammenligning et Par Karakterer, der kun kan passe for den ene, men aldeles ikke for den anden Art. Der er først den ovennævnte Apexform: "apice angigyro impresso" og dernæst "labro crasso, candissimo obtecta". *N. curta* har ikke nedtrykt Apex og Læben er aldrig tyk, men bestandig skarp.

Fig. 21 (Stat. 261, Tanafjord) repræsenterer Varieteten *Sarsi*, Jeffr. Den har et forholdsvis kortere Spir og mere tumide Vindinger.

Apex (Fig. 22) byder inden denne Underslægt saa smaa Afvigelser at en nærmere Karakteristik for hver Art vil i de fleste Tilfælde være overflødig. Embryonalvindingerne er hos de fleste glatte.

Operculum (Fig. 23 *a*, *b*) er hos den voxne tykt, sortbrunt, hornagtig, Formen afrundet triangulær med nedre Ende truncat. Hos ikke udviklede Exemplarer (Fig. 23 *b*) er nedre Ende tilspidset. Denne sidste Operculum-Form er det Duncker & Metzger har afbildet for *Fusus Moebi* (l. c. Tab. VI, Fig. 1) og tilkjendegiver, at det er et ungt Exemplar.

Neptunea (Siphonorbis) ebur, Mörch.

Pl. II, figs. 20—23, Pl. V, figs. 1—3.

Fusus (Siphonorbis) ebur, Mörch. Journ. d. Conch. 1869, p. 398.
Trophon Sarsii, Jeffr., S. Wood. Supp. to the Crag Moll. (1872), p. 25, Pl. I, fig. 9.
Fusus Moebi, Duncker & Metzger, Exped. zur Unters. d. Nordsee, 1875, p. 260, Pl. VI, fig. 1.
Fusus ebur, (Mörch), Friele, Prelim. Rep. Nyt Mag. XXIII, 1877, p. 7.

Habitat: — Stats. 25, 261, 290, and 323; from 90 to 223 fathoms.

Respecting this species there has been much difference of opinion. Dr. Jeffreys, as mentioned above, regards it as one of the many synonyms of *N. curta* (Fusus Sabinii); but direct comparison with Mörch's type, which Prof. Dr. Steenstrup kindly lent me, has convinced me that these two species are widely different. The specimen represented in fig. 20 comes very near the typical form of *Siphonorbis ebur* (the type has a somewhat longer spire).

Exclusive of the depressed and perfectly regular apex peculiar to the subgenus ("spira apice angigyro, impresso," Mörch), the short, broad canal, giving to the shell the appearance of a *Buccinum*, constitutes a salient specific character. Dr. Mörch has himself led to the frequent confounding of this species with its distant congener *N. curta;* for his simultaneously published diagnoses of *N. ebur* and *N. togata* have so much in common that one naturally regards them as referring to trifling modifications of form. The specimen of *N. ebur* described by Mörch had been taken from a fish's stomach; hence it is a good deal worn; the lip, too, is damaged. One would imagine that a desire to be guarded, must have induced Mörch to furnish so incomplete a diagnosis. And yet, on comparison, one or two characters only are found to distinguish the species in question, characters altogether wanting in the other. First, there is the form of the apex mentioned above: — "apice angigyro impresso," and then: — "labro crasso, candissimo obtecta." Now, in *N. curta* the apex is not depressed, nor the lip thick, but invariably sharp.

Fig. 21 (Stat. 261, in the Tanafjord) represents the variety *Sarsi*, Jeffr. It has a relatively shorter spire and more tumid whorls.

The *apex* (fig. 22) exhibits such trifling variations within this subgenus, that a more detailed characteristic for each species will in most cases be superfluous. The embryonic whorls are as a rule smooth.

Operculum (fig. 23 *a*, *b*) in the adult thick, dark-brown, horny; form rounded, triangular, with lower end truncate. In immature specimens (fig. 23 *b*) the lower end pointed. This last form of the operculum is figured by Duncker and Metzger for *Fusus Moebi* (l. c., Pl. VI, fig. 1), showing the specimen represented to have been a young one.

Tænderne (Tab. V, Fig. 1—3) er i den Grad uregelmæssige, at ingen af de af mig undersøgte 4 Exemplarer lige saa lidt som Duncker & Metzgers (l. c. Fig. 1 *a*) falder sammen.

Centralpladen er bred, Skjæreranden uddraget og dens 3 Tænder tæt sammenstillede, undertiden sammenvoxne, Dorsalranden stærkt indbugtet. Sidepladerne har yderste Tand lang, men forøvrigt er Antallet af Tænder yderst variabelt. Rækkernes Antal er omkring 100.

Artens geografiske Udbredelse, saavidt som endnu kjendt, er langs den norske Kyst fra Bergen til Havet imellem Norge og Novaja Semlja (72° 31′ N. B. og 21° 51′ Ø. L.), Shetland ("Porcupine" Exp., Jeffr.) og Grønland (Mørch). Fossil er den funden i den engelske Crag.

I "Supp. to the Crag Moll." har S. Wood i Add. Pl. Fig. 11 afbildet *Buccinum Tomelinei* Canham, M. S. Ved at sammenligne denne Tegning med vor. Fig. 23, vil man finde en paafaldende Lighed imellem disse to. I Beskrivelsen Pag. 175 siger rigtignok Mr. Wood, at Skallen ligner *B. Dalei*, men det gjør ikke Tegningen, og er denne korrekt, skulde det undre mig om det ikke er et udviklet Exemplar af *N. ebur* Mr. Wood har havt for sig.

The *dentition* (Pl. V, figs. 1—3) varies exceedingly, so much so indeed, that each of the four specimens examined by myself, as also Duncker and Metzger's specimen (l. c., fig. 1 *a*), present numerous points of difference.

Central plate broad, incisory margin prolonged, with its 3 cusps closely arranged, sometimes grown together; dorsal margin much incurved. Laterals with the outermost cusp long; for the rest, the number of cusps very inconstant. Rows about 100.

The geographical distribution of this species up to the present time, is known to range from Bergen to the tract of ocean between Norway and Novaja Zemlja (lat. 72° 31′ N., long. 21° 51′ E.), off the Shetland Islands ("Porcupine" Expd., Jeffr.), and the coast of Greenland (Mörch). In a fossil state it has been met with in the English crag.

In "Supp. to the Crag Moll.," Add. Pl., fig. 11, S. Wood has given a drawing of *Buccinum Tomelinei*, Canham, M. S. On comparing Wood's drawing with that given in fig. 23, there will be found a striking resemblance. In his description on page 175, Mr. Wood certainly states that the shell approximates in appearance *B. Dalei*; but such is not the case in his drawing, and, assuming the latter to be correct, I feel pretty sure Mr. Wood must have had before him an adult specimen of *N. ebur*.

Neptunea (Siphonorbis) fusiformis, Brod.

Buccinum fusiforme, Broderip. Zool. Journ. V, Pag. 45, Pl. III, Fig. 3.
Fusus fenestratus, Turton. Ann. & Mag. VII, Pag. 351.

Forekomst: St. 79, 195 og 290; fra 107 til 191 Favne.

Den er kjendt langs den hele norske Kyst til Vadsø (Sars) og dens Nordgrændse er Stat. 290 (72° 27′ N. B., 20° 51′ Ø. L.); Sydgrændsen er den britiske Canal (Jeffr.). Dr. Jeffreys har anført den fra Grønland.

Tænderne hører ifølge Sars (l. c. Pl. X, Fig. 25) til *N. islandica* Gruppen.

Neptunea (Siphonorbis) fusiformis, Brod.

Buccinum fusiforme, Broderip. Zool. Journ. V, p. 45, Pl. III, fig. 3.
Fusus fenestratus, Turton. Ann. & Mag. VII, p. 351.

Habitat: — Stats. 79, 195, and 290; from 107 to 191 faths.

This species occurs along the whole of the Norwegian coast, from the extreme south to Vadsø. It was met with as far north as Stat. 290 (lat. 72° 27′ N., long. 20° 51′ E.); the British Channel is the southern limit of its distribution (Jeffr.). Dr. Jeffreys has recorded the species from Greenland.

The dentition, according to Sars (l. c., Pl. X, fig. 25), is that of the *N. islandica* group.

Neptunea (Siphonorbis) Dalli, n. sp.

Tab. II, Fig. 18—19.

Testa turrita, fusiformis, anfractibus $7^1/_2$ convexis, superne planulatis, sutura profunda, apertura pyriformi, dimidiam testae longitudinem aequante, canali longo, pro-

Neptunea (Siphonorbis) Dalli, n. sp.

Pl. II, figs. 18, 19.

Testa turrita, fusiformis, anfractibus $7^1/_2$ convexis, superne planulatis, sutura profunda, apertura pyriformi, dimidiam testae longitudinem aequante, canali longo, pro-

fundo, angustato, inferne arcuato, apice angigyro, depresso. Superficies costis crassis funiformibus (in anfractibus penultimis 4 vel 3), una minus prominula interposita, striis longitudinalibus densis, distinctis, obliquis sculpta.

Magn. long. 26, *lat.* 12mm, *Apert. long.* 13mm, *diam. max.* $5^1/_2$mm.

Forekomst: St. 290 og 323; fra 191 til 223 Favne.

I sin ydre Form kommer denne Art *N. turrita*, Sars, nærmest, men Sculpturen er væsentlig forskjellig. De kraftige Spiralribber nærme sig til Kjøle, saaledes at Spirets Vindinger faar Udseende af at være 3-carineret, og Længdestriberne ere kraftigere og regelmæssigere end almindelige Væxtstriber. Ovenpaa de afplattede Vindinger findes ogsaa 1 til 3 Spiralribber, men af secundær Styrke.

Apex (Fig. 19) er regelmæssig, fladtrykt og Embryonalvindingen glat.

Af Fig. 19 vil man faa et bedre Indtryk af Sculpturens Detaljer paa Spiret.

De 4 Exemplarer, der er fundne, var alle døde, saaledes at ingen Oplysning kan gives om Operculum og Radula.

Professor G. O. Sars har fundet et ligeledes dødt Exemplar i Varangerfjorden, og Dr. Jeffreys har den, ifølge brevlig Meddelelse fra "Porcupine" Expeditionen (St. 64 640 Favne).

fundo, angustato, inferne arcuato, apice angigyro, depresso. Superficies costis crassis funiformibus (in anfractibus penultimis 4 vel 3), una minus prominula interposita, striis longitudinalibus densis, distinctis, obliquis sculpta.

Magn. long. 26mm, *lat.* 12mm, *apert. long.* 13mm, *diam. max.* $5^1/_2$mm.

Habitat: — Stats. 290 and 323; from 191 to 223 faths.

In its habitus, this species comes nearest to *N. turrita*, Sars, but the sculpture is essentially different. The prominent spiral costæ give to the whorls a triply carinated appearance, and the longitudinal striæ are more prominent and regular than is commonly the case with the lines of growth. Upon the angulated part of the whorls are from 1 to 3 spiral ribs, but of secondary prominence.

Apex (fig. 19) regular, depressed, and with the embryonic whorls smooth.

Fig. 19 will give a better idea of the sculpturing on the spire.

The 4 specimens collected were all dead ones; and hence there is nothing to record of the operculum and the radula.

Professor G. O. Sars found a dead specimen in the Varanger Fjord, and Dr. Jeffreys informs me that the species occurred on the "Porcupine" Expedition. (Stat. 64; 640 fathoms).

Neptunea (**Siphonorbis**) **turrita**, M. Sars.

Pl. II, Fig. 24—27, Pl. V, Fig. 4—5.

Tritonium turritum, M. Sars. Forh. Vidensk. Selsk. 1858, Pag. 39.

Sipho tortuosus, Kobelt. Jahrb. Mal. Gesell. 1876, Pag. 72, Pl. II, Fig. 2.

Sipho tortuosus, G. O. Sars. Moll. Reg. Arct. Norv. Pag. 272, Pl. 15, Fig. 4—5, og Pl. 25, Fig. 10.

Chrysodomus turritus, Dall. Alaska Buccinidæ, Pl. III, Fig. 4.

Forekomst: Stat. 18, 124, 147, 164, 192, 260, 261, 273, 323 og 363; fra 127 til 649 Favne.

Hvad Valget af Navn angaar, da har jeg holdt mig til afdøde Prof. M. Sars's. Baade Dr. Kobelt og Prof. G. O Sars har derimod fundet Grund at foretrække Reeves Navn *tortuosus* for at betegne nærværende Form, og om end jeg tror, at denne Opfatning af Reeves Art er correct, saa har jeg dog den Betænkelighed ved at benytte et omtvistet Navn, at det kan give Anledning til Misforstaaelse. Mr. E. A. Smith har saaledes benyttet dette Reeves Navn for at betegne *N. curta* dog "with considerable doubt" (Ann. & Mag. 1877, Pag. 132) og er ikke Tegning eller tilfredsstillende Synonomi vedføiet, kan man let komme i Tvivl om, hvad der menes. Som før nævnt mangler Typeexemplaret en meget vigtig Karakter for en fuldt betryggende Bestemmelse, nemlig Apex, og uden denne vil man altid komme at tvistes om, hvor Reeves *tortuosus* hører hjemme.

Prof. G. O. Sars har i sit ovenciterte Arbeide fuldt tilfredsstillende gjengivet nærværende Arts vigtigste Af-

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Neptunea (**Siphonorbis**) **turrita**, M. Sars.

Pl. II, figs. 24—27, Pl. V, figs. 4, 5.

Tritonium turritum, M. Sars, Forh. Vidensk. Selsk. 1858, p. 39.

Sipho tortuosus, Kobelt, Jahrb. Mal. Gesell. 1876, p. 72, Pl. II, fig. 2.

Sipho tortuosus, G. O. Sars, Moll. Reg. Arct. Norv., p. 272, Pl. 15, figs. 4, 5, Pl. 25, fig. 10.

Chrysodomus turritus, Dall, Alaska Buccinidæ, Pl. III, fig. 4.

Habitat: — Stats. 18, 124, 147, 164, 192, 260, 261, 273, 323, and 363; from 127 to 649 fathoms.

As to the name for this species, I have retained that given by the late Professor M. Sars. Dr. Kobelt and Professor G. O. Sars have, indeed, both seen fit to prefer the name *tortuosus*, proposed by Reeve; but yet, though sharing their views concerning his species, I hesitate to adopt a contested appelation, which may not improbably give rise to confusion. Thus, for instance, Mr. E. A. Smith has selected this name of Reeve to designate *Neptunea curta*, though "with considerable doubt" (Ann. & Mag., 1877, p. 132); and, unless a drawing or a sufficiently extensive synonymy be appended, it may be doubtful which species is meant. As previously stated, a most important character is wanting in the type-specimen of Reeve, viz. the apex, and without this character there will always be some uncertainty where to refer the species.

Professor G. O. Sars has accurately represented in the work cited above, Pl. 15, figs. 4, 5, Pl. 25, fig.

ændringer i Tab. 15, Fig. 4, 5, og Tab. 25, Fig. 11. At alle disse 3 Former kun er Varieteter af samme Art har ogsaa jeg havt Anledning at overbevise mig om, thi den smukke Række af ikke mindre end nær 50 Exemplarer fra 10 forskjellige Stationer giver en rig Leilighed at lære Grændserne for Artens Foranderlighed at kjende.

Dr. Jeffreys har holdt den for en Varietet af *Neptunea propinqua,* Alder, men nogen Overgang til denne Art har jeg ikke havt Anledning at se. Saa langt som min Erfaring strækker, vil altid *N. turrita* udmærke sig ved en længere og mere indkneben Kanal og som Regel mere tumide Vindinger. *N. propinqua* forekommer ikke ved den norske Kyst.[1]

Sars angiver, at Dr. Jeffreys har selv identificeret Varieteten *attenuata* (l. c. Pl. 15, Fig. 5), der er den hyppigst forekommende, med *Fusus attenuatus,* Jeffr. (Ann. & Mag. 1876. "Valorous" Exped. Pag. 326). Hos Dr. Jeffreys har jeg havt Anledning at gjøre mig bekjendt med denne Form, men paa mig gjorde *Fusus attenuatus* det Indtryk, at det var en fra *N. turrita* vel adskilt Art. Som Differentialmærker har jeg noteret mig, at Kanalen er mere ret og aaben og Vindingerne fladere. Den hører forøvrigt ligesom *turrita* under *Siphonorbis,* og er ikke funden paa den norske Expedition.

N. turrita forekommer langs den norske Kyst fra Bergen lige til 80° N. B.; i Kjøbenhavner-Musæet har jeg seet den fra Grønland og Mr. Dall har den fra Alaska.

Apex (Tab. II, Fig. 25) er nedtrykt og glat.

Operculum (Fig. 24) er langt oval og nedre Ende indadbøiet.

Unge Exemplarer (Fig. 26 *a, b*) viser allerede paa det tidligste Stadium den fuldstændig regelmæssig byggede Apex.

Paa Stat. 261 (Tanafjord) fandtes to Ægkapsler fæstede paa den indvendige Side af *Astarte crenata* (Fig. 27). De ere smaa (5mm Diam.), halvkugleformige, citrongule. Ingen af dem indeholdt udviklede Embryoner.

Tænderne (Tab. V, Fig. 4—5) ligner *N. curtas.*

Rækkernes Antal er fra 95 til 110.

11, the chief modifications of this species. That all 3 forms are mere varieties of the same species, I, too, have satisfied myself, the rich collection of close upon 50 specimens from 10 different Stations having afforded ample opportunity of determining the limits within which the species is found to vary.

Dr. Jeffreys regards it as a variety of *Neptunea propinqua,* Alder; but I have not met with any transition to this species. So far as my experience goes, *N. turrita* is always distinguished by a longer and more constricted canal, and it has, too, as a rule, more tumid whorls. *N. propinqua* does not occur on the coast of Norway.[1]

Sars states, that Dr. Jeffreys has himself identified the variety *attenuata* (l. c. Pl. 15, fig. 5) as *Fusus attenuatus,* Jeffr. (Ann. & Mag. 1876. "Valorous" Expd., p. 326). I had opportunity of examining this form in Dr. Jeffreys's Collection; but *Fusus attenuatus,* it appeared to me, was a species perfectly distinct from *N. turrita.* The canal, I observed, was comparatively more open and straight, and the whorls flatter. For the rest, *attenuatus* must, like *turrita,* be referred to *Siphonorbis. Neptunea attenuata* was not met with on the Norwegian Expedition.

N. turrita occurs along the Norwegian coast, from Bergen to as far north as 80°. In the Copenhagen Zoological Museum I saw specimens from Greenland, and Mr. Dall records it from Alaska.

Apex (Pl. II, fig. 25) depressed, smooth.

Operculum (fig. 24) ovato-oblong, with the lower extremity bent inwards.

The *young ones* (fig. 26 *a, b*), have the apex perfectly regular.

At Station 261 (in the Tanafjord) two egg-capsules came up, attached to the inner side of *Astarte crenata* (fig. 27). They are small (5mm in diameter), semi-globose, and citron-yellow in colour. Neither of them contained fully developed embryos.

Dentition (Pl. V, figs. 4, 5) as in *N. curta.*

Number of rows varying from 95 to 110.

Neptunea (Siphonorbis) lachesis, Mørch.

Tab. II, Fig. 28—32, Tab. V, Fig. 6—7.

Fusus (Siphonorbis) lachesis, Mørch. Journ. d. Conch. XVII (1869) Pag. 397.

Tritonium terebrale, M. Sars, M. S.

Neptunea (Siphonorbis) lachesis, Mörch.

Pl. II, figs. 28—32, Pl. V, figs. 6, 7.

Fusus (Siphonorbis) lachesis, Mörch, Journ. d. Conch. XVII (1869), p. 397.

Tritonium terebrale, M. Sars, M. S.

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[1] *Fusus ebur,* Kobelt, fra Finmarken har været berigtiget til *Fusus propinquus,* var., men det er vist tvivlsomt, om den hører denne Art til. Dr. Kobelt meddeler mig, at Embryo-alvindingen er borte.

[1] *Fusus ebur,* Kobelt, from Finmark, has been corrected to *Fusus propinquus,* var.; but it is doubtful whether this shell really belongs to that species. Dr Kobelt informs me that the embryonic whorl is gone

Forekomst: Stat. 18, 124, 137, 164, 192, 323, 326 og 338; fra 123 til 649 Favne.

Paa alle disse Stationer forekom den typiske Form (Fig. 28).

Var. **bicarinata.**

Fig. 29.

Neptunea lachesis, var. *bicarinata*, Fr. Jahrb. Mal. Gesell. 1879, Pag. 282.

St. 312 (658 Favne).

Varieteten adskiller sig fra Typeformen ved en skarpere Sculptur og særlig har de øvre Vindinger 2 Ribber stærkt fremtrædende; Epidermis er haaret, og de fremtrædende Ribber er beklædt med længere stive Haar, hvilket yderligere bidrager til at give Skallen Udseende af at være bicarineret. Det største Exemplar har 13 Vindinger og maaler 61^{mm} lang, 18^{mm} bred, hvorimod Typeformen kun opnaar en Længde af 45^{mm} og Bredde 15^{mm} og har høist 11 Vindinger.

Apex (Fig. 30) nedtrykt, svagt decusseret, og kun første Embryonalvinding er ganske glat.

Operculum (Fig. 31) er langt, fusiform og bøiet for nedre Ende.

De unge (Fig. 32 *a*, *b*) har en forholdsvis grovere, mere kjølet Sculptur, og Mundaabningens Forhold til Spiret er ganske forskjéllig fra den Voxnes.

Tænderne (Tab. V, Fig. 6—7) ligne meget *Neptunea despectas*.

Rækkernes Antal omkring 100.

Neptunea (Siphonorbis) undulata, n. sp.

Tab. II, Fig. 33—35, Tab. V, Fig. 8.

Testa turrita, fusiformis, alba, anfractibus 9 convexis, leviter crescentibus, sutura profunda, apice angigyro, depresso, apertura pyriformi, testa breviore, canali sat longo, angusto, profundo, columella parum flexuosa. Superficies lineis spiralibus liratis, quarum nonnullae minus conspicuae, plicisque longitudinalibus 14—15 crassis, in primariis tamen anfractibus nullis sculpta, epidermide tenui, hirta, flavescente, operculo aurito.

Magn. long. $18^1/_2$^{mm}, *lat.* 8^{mm}, *Apert. long.* $8^1/_2$^{mm}.

Forekomst: St. 290 (190 Favne).

Foruden det her beskrevne og Fig. 33 afbildede Exemplar fandtes sammesteds et friskt Fragment, der viser, at Arten kan antage betydelig større Dimensioner. Epidermis er hos det yngre Exemplar fint haaret, men synes hos den Voxne at være glat.

Apex (Fig. 34) er ligesom hos foregaaende Art decusseret med glat Embryonalvinding.

Habitat: — Stats. 18, 124, 137, 164, 192, 323, 326, and 338; from 123 to 649 fathoms.

The typical form (fig. 28) occurred at all these Stations.

Var. **bicarinata.**

Fig. 29.

Neptunea lachesis, var. *bicarinata*, Fr., Jahrb. Mall. Gesell. 1879, p. 282.

Habitat: — Stat. 312 (658 fathoms).

This variety is distinguished from the typical form by its well-defined sculpturing, and in particular by having two of the ribs on the upper whorls more prominent. Epidermis hispid, and the prominent ribs bearing long stiff bristles, which still further contributes to give the shell a bicarinate appearance. The largest specimen has 13 whorls, and measures 61^{mm} in length and 18^{mm} in breadth, whereas the type-form does not exceed 45^{mm} in length and 15^{mm} in breadth, and has only 11 whorls.

Apex (fig. 30) depressed, slightly decussated, and with only the first embryonic whorl quite smooth.

Operculum (fig. 31) elongate-fusiform, bent at the lower extremity.

Young individuals (fig. 32 *a*, *b*) have the sculpture coarser and more carinated, and the relation between the aperture and the spire is wholly different from that in adults.

Dentition (Pl. V, figs. 6, 7) closely resembling that in *Neptunea despecta*.

Number of series about 100.

Neptunea (Siphonorbis) undulata, n. sp.

Pl. II, figs. 33—35, Pl. V, fig. 8.

Testa turrita, fusiformis, alba, anfractibus 9 convexis, leviter crescentibus, sutura profunda, apice angigyro, depresso, apertura pyriformi, testa breviore, canali sat longo, angusto, profundo, columella parum flexuosa. Superficies lineis spiralibus liratis, quarum nonnullae minus conspicuae, plicisque longitudinalibus 14—15 crassis, in primariis tamen anfractibus nullis sculpta, epidermide tenui, hirta, flavescente, operculo aurito.

Magn. long. $18^1/_2$^{mm}, *lat.* 8^{mm}, *apert. long.* $8^1/_2$^{mm}.

Habitat: — Stat. 290 (190 fathoms).

Exclusive of the specimen here described, and represented in fig. 33, a recent fragment was brought up in the same trawl, the size of which indicates that the species can attain considerably larger dimensions. The epidermis is in the younger specimen velvety; in the adult, it appears to be smooth.

Apex (fig. 34) decussated, as in the preceding species, with smooth embryonic whorl.

Operculum (Fig. 35) er øredannet og nederste Ende er ikke saa indadbøiet som hos foregaaende Art. For at faa fat paa Operculum og Radula var jeg nødt at bløde Skallen i Kalioplφsning. Derved kom Operculum frem i en noget opløst Tilstand, og maaske viser derfor Tegningen en bredere Form end det oprindelig har.

Nærmest vor Art staar *N. lachesis*, Mørch, fra hvilken den dog let adskiller sig ved Længdefolderne. Disses Antal er hos det ene Exemplar 14, hos det andet 15.

Tænderne (Tab. V, Fig. 8). Centralpladen er firkantet og forsynet kun med en Tand paa Skjæreranden; Sidepladerne har 2 omtrent lige store Tænder. Der har kun været Anledning at undersøge et Exemplar, og dette viser en fra de øvrige *Neptunea* afvigende Tandstructur, som kun finder noget tilsvarende hos *Mohnia*. Hos *N. turgidula* er der paavist en Tandvariation, som gaar meget nær ind paa den her beskrevne, og hvad man derfor i dette Tilfælde har for sig, enten en Normalform eller en tilfældig Varietet, er vanskelig at sige efter en saa utilstrækkelig Undersøgelse.

Neptunea (Siphonorbis) Danielsseni, Friele.

Tab. III, Fig. 1—6. Tab. V, Fig. 9—13.

Neptunea (Sipho) Danielsseni, Fr. Jahrb. Mal. Gesell. 1879, Pag. 282.

Testa tenuis, albida, fusiformi-turrita, anfractibus 7 valde tumidis, sat crescentibus, sutura profunda, fere canaliculata, apice depresso, regulari, apertura pyriformi, $^3/_7$ testae longitudinis occupante, columella leviter flexuosa, canali brevi et lato, callo sat crasso. Superficies costis spiralibus crassis, tamen in anfractu primario evanescentibus, striis longitudinalibus numerosis sculpta, epidermide tenui, flavescente, hispida, operculo ovali, nucleo subterminali, sublaterali.

Magn. long. 39^{mm}, lat. 22^{mm}; apert. long. 20^{mm}, diam. max. 11^{mm}.

Forekomst: Stat. 51 (Fragmenter), 295, 303 og 353; fra 1110 til 1333 Favne.

Sculpturen har meget tilfælles med *N. Dalli*, men Ribberne er ikke afrundede, derimod skarpe. Ribbernes Antal er paa næstsidste Vinding 5, men undertiden forekommer imellem disse svagere Ribber.

Apex (Fig. 3) er stump, og kun første Embryonalvinding er glat.

Operculum (Fig. 4) er ovalt. Nucleus subterminal, og

Operculum (fig. 35) auriculate, the lower end not so much bent as in the preceding species. To get at the operculum and the radula, I had to soak the shell in a solution of caustic potash, thereby partially dissolving the operculum; and hence its breadth, as shown in the figure, is perhaps a trifle in excess of what it should be.

This species bears closest resemblance to *N. lachesis*, Mörch, from which, however, it is easily distinguished by the longitudinal folds. The number of folds is in the one specimen 14, in the other 15.

Dentition (Pl. V, fig. 8): — Central plate quadrangular, and furnished with only one cusp; laterals with 2 cusps, about equal in size. There has not been opportunity of examining more than one specimen, and that differs widely in the structure of the teeth from all other species of *Neptunea*, saving *Mohnia*, which exhibits features analogous. A variety of dentition closely approximating that here described, occurs, as mentioned above, in *N. turgidula*; and whether indeed, in a case like the present, one has to do with a distinct normal form or a mere casual variety, it is difficult to decide from the results of so inadequate an examination.

Neptunea (Siphonorbis) Danielsseni, Friele.

Pl. III, figs. 1—6, Pl. V, figs. 9—13.

Neptunea (Sipho) Danielsseni, Fr., Jahrb. Mal. Gesell. 1879, p. 282.

Testa tenuis, albida, fusiformi-turrita, anfractibus 7 valde tumidis, sat crescentibus, sutura profunda, fere canaliculata, apice depresso, regulari, apertura pyriformi, $^3/_7$ testae longitudinis occupante, columella leviter flexuosa, canali brevi et lato, callo sat crasso. Superficies costis spiralibus crassis, tamen in anfractu primario evanescentibus, striis longitudinalibus numerosis sculpta, epidermide tenui, flavescente, hispida, operculo ovali, nucleo subterminali, sublaterali.

Magn. long. 39^{mm}, lat. 22^{mm}; apert. long. 20^{mm}, diam. max. 11^{mm}.

Habitat: — Stats. 51 (fragm.), 295, 303, and 353; from 1110 to 1333 fathoms.

The sculpturing has much in common with that in *N. Dalli*; the ribs, however, are not rounded, but sharp. Number of ribs on penultimate whorl 5, between which, however, now and then, occur less prominent ribs.

Apex (fig. 3) obtuse, with only the first embryonic whorl smooth.

Operculum (fig. 4) oval, the nucleus subterminal, with

der er en svag Antydning til Spiral. Den danner saaledes en Overgang til *Mohnia*.

I "Zoology of Kerguelen Island" har Mr. E. A. Smith beskrevet en ny Slægt *Neobuccinum*, der, efter Radulakarakteren at dømme, er en ægte *Neptunea*, da baade Centralplade og Sideplade er "tricuspidate". Operculum hos denne Slægt har "nucleo laterali, vix terminali". Jeg har været i nogen Tvivl om vor Art ikke burde udsondres af *Siphonorbis* og enten placeres under Smiths *Neobuccinum* eller *Mohnia*, men da Karakteren i den Grad falder i det minutiøse, at den grændser ind paa det mikroskopiske, har praktiske Grunde bevæget mig at lade den staa under *Siphonorbis*.

Dyret fik jeg desværre ikke Anledning at tegne, men har kun observeret, at det er uden Øine. Af 8 levende Exemplarer mangle de 2 Operculum.

Ægkapslen (Fig. 6) er høi kuppelformig, 6mm bred med noget smal Rand og indeholder kun et Embryon. En Ægkapsel blev funden fæstet til et Sabellarør.

Embryonet (Fig. 5 *a*, *b*) er skinnende hvid, gjennemsigtig og glat; kun langs yderste Læberand begynder den grove Sculptur at komme frem.

Tænderne (Tab. V, Fig. 9—13) har Centralpladen firkantet med 3 noget tætstaaende Tænder paa Skjæreranden, den midterste længst; Sidepladerne ligeledes 3-tandet, den midterste Tand mindst. Dette er Normalformen, men der forekommer hyppige og betydelige Afvigelser herfra. Fig. 10 har saaledes en Centralplade med kun en Tand, og den ene Sideplade er firetandet. Alle de Arter af *Neptunea*, som har Centralpladens 3 Tænder tæt sammenstillede, saasom *N. turgidula*, *ebur* og nærværende Art, har Tilbøielighed at variere over til en entandet Centralplade. Fig. 11 og 12 har Sidepladerne meget uregelmæssige, og hos den første er Centralpladen firetandet.

Rækkernes Antal varierer fra omtrent 90 til noget over 100.

Subgen. **Mohnia**, Friele.
Operculum spiraldreiet.

Neptunea (Mohnia) Mohni, Friele.

Tab. III, Fig. 7—11, Tab. V, Fig. 14—15.

Fusus Mohni, Fr. "Prelim. Rep." Nyt Magaz. for Naturv. 1877, Pag. 6.

Sipho Mohni (Mohnia), Kobelt, Jahrb. Mal. Gesell. 1878, Pag. 282, Tab. IX, Fig. 5 & 5 *a*.

Neptunea (Mohnia) Mohni, Fr. Jahrb. Mal. Gesell. 1879, Pag. 283.

a faint indication of a spiral. This is accordingly a transition form approximating *Mohnia*.

In "Zoology of Kerguelen Island," Mr. E. A. Smith has described a new genus, *Neobuccinum*, which, to judge from the character of the radula, must be a true *Neptunea*, both the central and the lateral plate being "tricuspidate." *Operculum* in this genus has "nucleo laterali, vix terminali." I have been in doubt whether *N. Danielsseni* ought not to be excluded from *Siphonorbis*, and either referred to *Neobuccinum* or *Mohnia*; but the character being of well-nigh microscopic minuteness, practical reasons have induced me to leave it under *Siphonorbis*.

Unfortunately, I did not get an opportunity of figuring the animal, but I have observed that it is without eyes. Of 8 living specimens, the operculum is wanting in two.

The egg-capsule (fig. 6) is high, cupola-shaped, 6mm broad, and contains only one embryo. A capsule came up attached to the tube of a *Sabella*.

Embryo (fig. 5 *a*, *b*) lustrous white, semi-translucent and smooth; nothing to be seen of the coarse sculpturing, save along the extreme edge of the lip, where it has just begun to appear.

Dentition (Pl. V, figs. 9—13): — Central plate quadrangular, with 3 rather closely arranged cusps, the median being the longest; the laterals likewise furnished with 3 cusps, of which the median is the smallest. This is the normal structure, but frequent and considerable modifications occur. The radula represented in fig. 10 has, for instance, the central plate furnished with a single cusp only, and one of the laterals has 4 cusps. All the species of *Neptunea* that have the cusps of the central plate closely set together, such as *N. turgidula*, *N. ebur*, and the present one display a tendency of passing into a unicuspidate central plate. The radulas represented in figs. 11 and 12 have the laterals very irregular; and in the former, the central plate is four-toothed.

Number of rows varying from about 90 to upwards of 100.

Subgen. **Mohnia**, Friele.
Operculum spirally twisted.

Neptunea (Mohnia) Mohni, Friele.

Pl. III, figs. 7—11, Pl. V, figs. 14—15.

Fusus Mohni, Fr., "Prelim. Rep." Nyt Magaz. for Naturv., 1877, p. 6.

Sipho Mohni (Mohnia), Kobelt, Jahrb. Mal. Gesell. 1878, p. 282, Pl. IX, figs. 5, 5 *a*.

Neptunea (Mohnia) Mohni, Fr., Jahrb. Mal. Gesell. 1879, p. 283.

Testa fusiformis, alba, subpellucida, epidermide tenui, nunc laevi, nunc hispidula induta, anfractibus 7 tumidis, non rapide crescentibus, sutura profunda separatis, superioribus 2 regulariter decussatis, sequentibus costis spiralibus elevatis, subtilibus, subconfertis, lineisque incrementi numerosis, sculptis, apice regulari, laevi, depresso. Apertura pyriformis, medio subdilatata, columella subarcuata, callo tenui obtecta, canali sat brevi, latiusculo, operculo tenuiusculo, bispirato.

Magn. long. 22mm, lat. 12mm; Apert. long. 11mm, lat. 6mm.

Forekomst: Stat. 51, 54, 205, 251, 283, 295, 303, 312 og 353; fra 601 til 1333 Favne.

I sin ydre Habitus kommer denne Art *N. Danielsseni* nærmest. Voxne Exemplarer af begge Arter er let at adskille paa Grund af den forskjelligartede Sculptur, men derimod kommer ofte de unge hinanden nær; dog vil Apex altid adskille dem.

Apex (Fig. 9) er hos *Mohni* glat, hvorimod den hos den anden Art er sculpteret lige til Embryonalvindingen.

Operculum (Fig. 10) er tyndt, temmelig stort, har 2 Spiralsnoninger, hvoraf den første er stor og naar nær ind paa Midtpartiet; den anden Snoning er ganske lille.

Ægkapslerne ligne i Form foregaaende Arts og indeholder ligeledes kun 1 Embryon.

Embryonet (Fig. 11 *a*, *b*) er fuldstændig glat, hvid, opak.

Tænderne (Tab V, Fig. 14—15) har Centralpladen firkantet, entandet, Sidepladen er totandet. Af 10 undersøgte Exemplarer viser kun en eneste Radula en ubetydelig Afvigelse (Fig. 15), idet der paa den ene Sideplade er Tegn til en 3die Tand.

Rækkernes Antal er fra 70 til omtrent 90.

Arten forekommer over hele den kolde Area imellem 600 og 1300 Favne, og er ogsaa af Dr. Jeffreys fundet paa "Porcupine" Expeditionen paa de større Dyb.

Testa fusiformis, alba, subpellucida, epidermide tenui, nunc laevi, nunc hispidula induta, anfractibus 7 tumidis, non rapide crescentibus, sutura profunda separatis, superioribus 2 regulariter decussatis, sequentibus costis spiralibus elevatis, subtilibus, subconfertis, lineisque incrementi numerosis, sculptis, apice regulari, laevi, depresso. Apertura pyriformis, medio subdilatata, columella subarcuata, callo tenui obtecta, canali sat brevi, latiusculo, operculo tenuiusculo, bispirato.

Magn. long. 22mm, lat. 12mm; apert. long. 11mm, lat. 6mm.

Habitat: — Stats. 51, 54, 205, 251, 283, 295, 303, 312, and 353; from 601 to 1333 fathoms.

In its habitus, this species approximates closest *N. Danielsseni*. The two forms may be readily distinguished in full-grown examples by reason of diversity in the sculpturing, but young specimens often bear very considerable resemblance to each other; the apex, however, will always serve to identify them.

Apex (fig. 9) in *Mohni* smooth; in the other species, sculptured up to the embryonic whorl.

Operculum (fig. 10) thin, rather large, and with 2 spiral twists; the first turn reaches almost in to the central part, the other is very small.

The *egg-capsules* similar in form to those of the foregoing species, and containing likewise one embryo.

The *embryo* (fig. 11 *a*, *b*) perfectly smooth, white, opaque.

Dentition (Pl. V, figs. 14, 15) — Central plate quadrangular, with one cusp; laterals two-cusped. Of 10 specimens examined, only one had the radula slightly modified (fig. 15), a rudimentary third tooth occurring on one of the lateral plates.

Number of series varying from 70 to about 90.

This species inhabits the cold area at a depth of from 600 to 1300 fathoms. It was also met with by Dr. Jeffreys on the "Porcupine" Expedition, throughout the deeper strata.

Troschelia Berniciensis, King.

Fusus Berniciensis, King. Ann. & Mag. XVIII, Pag. 246.
Troschelia (Gen.), Mørch. Journ. d. Conch. XXIV (1876), Pag. 370.
Boreofusus Berniciensis, G. O. Sars. l. c. Pag. 278.

Forekomst: St. 9, 10, 23, 79 og 255; fra 80 til 341 Favne.

Paa Stat. 10 forekom mange Exemplarer alle tilhørende Varieteten *inflata*, Jeffr., i en buget tyndskallet Form.

Troschelia Berniciensis, King.

Fusus Berniciensis, King. Ann. & Mag. XVIII, p. 246.
Troschelia (Gen.), Mörch. Journ. d. Conch. XXIV (1876), p. 370.
Boreofusus Berniciensis, G. O. Sars, l. c., p. 278.

Habitat: — Stats. 9, 10, 23, 79, and 255; from 80 to 341 fathoms.

At Station 10, the trawl brought up numerous specimens, all belonging to the variety *inflata*, Jeffr., a thin-shelled, tumid form.

Var. *elegans* fandtes paa Stat. 23.

Vestfjorden (Lofoten) er det nordligste Punkt Expeditionen paatraf denne Art, men Prof. Sars har den fra Finmarken. Dr. Jeffreys angiver den fra "Porcupine" Expeditionen nordenfor Skotland (155—632 Favne) og fra "Valorous" Exped. (690 Favne) imellem Britiske Øer og Grønland.

Fra Stat. 124 (350 Favne) haves en Ægkapsel, halvkugleformig med smal Rand og indeholdende kun 1 Embryon. Jeg skulde tro, at denne tilhører *Troschelia Berniciensis*, uagtet fuldt udviklede Exemplarer ikke her forekom. Enten maa den tilhøre *Troschelia* eller *Neptunea ebur*. Som ganske unge ligne disse to Arter hinanden ikke saa lidet, men den første har en noget grovere Spiralsculptur og en eiendommelig skarp Længdestriering. Embryonet er afbildet Tab. III, Fig. 12 *a*, *b*; det er stærkt opsvulmet, Spiret nedtrykt og næsten i Niveau med Hovedvindingen. Apex fuldstændig regelmæssig. Sculpturen spiralribbet og forsynet med stive Haar rundt Ribberne; rundt den grunde Sutur gaar ligeledes en Krands af Haar; Længdestriæ regelmæssig og skarpe.

Jeg havde haabet at finde frem Radula, hvad der flere Gange har lykkes mig med Embryoner paa et lignende Udviklingstrin, for derved at faa Arten konstateret, men desværre uden Held, saa fuld Sikkerhed for Bestemmelsen kan ikke gives. De grove distancerede Spiralribber og den regelmæssige Længdestriering synes dog at pege mere mod *Troschelia Berniciensis* end mod *Neptunea ebur*.

Buccinum.

Hvad der er Art og hvad der er Varietet inden denne Slægts polymorphe Former er vanskelig at afgjøre, og Vanskeligheden bliver ikke mindre, jo større Materiale man har for sig. Flere hundrede Specimina fra en Mængde Lokaliteter ligger for mig, og naar hertil kommer de mange Former, som jeg har seet omkring i de europæiske Museer og private Samlinger, løber det saaledes sammen, at jeg kunde være fristet til kun at erkjende en Art for de nordiske *Buccina*. Men om end der synes at være Overgange imellem de fleste Arter, saa vil en saadan Sammenslaaen af Former neppe være heldig; thi mange af disse have en speciel lokal Interesse, og deres Forekomst er indenfor bestemte geografiske Grændser. Saaledes optræder *B. groenlandicum* paa denne Side af Atlanterhavet først nordenfor

Var. *elegans* came up at Station 23.

The Vestfjord (Lofoten) was the most northerly point at which the North-Atlantic Expedition obtained specimens of this species; but Professor Sars has taken it in Finmark. Dr. Jeffreys ("Porcupine" Exped.) records it from the north of Scotland (155—632 faths.), and also ("Valorous" Exped.) between Great Britain and Greenland, at a depth of 690 fathoms.

At Station 124, depth 350 fathoms, was obtained an egg-capsule, semi-globose, with a narrow margin, and containing only one embryo. The Expedition did not meet with *Troschelia Berniciensis* in this locality, but yet I have reason to believe the capsule belongs to that species; any other known form, saving possibly *Neptunea ebur*, is at all events out of the question. In the earliest stages of development these two species resemble each other not a little; but the former has a somewhat coarser sculpturing and a peculiar well-defined longitudinal striature. The embryo, represented in Pl. III, fig. 12 *a*, *b*, is much inflated; spire depressed and almost on a level with the body-whorl. The apex perfectly regular. The spiral ribs of the sculpturing are furnished with stiff bristles; the shallow suture having likewise a fringe of hairs, the longitudinal striæ are regular and distinct.

I had hopes to extract the radula, — which I have several times succeeded in doing with embryos in the same early stage of development, — and thus identify the species, but failed, I am sorry to say, in the attempt; and hence a conclusive determination is impossible. Meanwhile, the distant and coarse-ribbed spiral sculpture, along with the regular longitudinal striature, would seem rather to be in favour of *Troschelia Berniciensis* than of *Neptunea ebur*.

Buccinum.

To decide what are species and what varieties within the polymorphous forms of this genus is indeed a delicate question to adjust; and the difficulty does not tend to diminish in proportion as the subjects of examination increase. Several hundreds of specimens from a number of localities lie before me; and adding to these all the forms I have seen in the Museums of Europe and in private Collections, the confusion is such, that I am tempted to acknowledge only one species of the northern *Buccina*. But, though transition-forms, apparently do occur in most of the species, a general heaping together of these congeners can hardly be either practical or advisable, seeing that to many of the forms attaches special local interest, their distribution being strictly confined within certain geographical

Polarcirkelen; forekommer i Begyndelsen sammen med *B. undatum*, men i de rent arktiske Have afløser den denne fuldstændigt; *B. finmarchianum* afløser den sydligere *B. Humphreysianum* for atter igjen i Ishavet at blive afløst af *B. hydrophanum*.

I min foran nævnte Afhandling "Ueber die Variationen der Zahnstructur bei *Buccinum*" fremsatte jeg den Formodning, at flere Arter sandsynligvis hybridiserer og begrundede dette i den Omstændighed, at Overgangsformerne just er at finde der, hvor flere Arter forekommer talrig sammen. *B. undatum* og *groenlandicum* findes saaledes i stor Mængde littoral ved Hammerfest, og her løbe ogsaa begge Former fuldstændig i hinanden; ved Spitsbergen, hvor flere Arter, saasom *B. groenlandicum, undulatum, glaciale* og *Terræ Novæ* forekommer sammen, vil man ligeledes finde Former, overfor hvilke man vil staa meget tvivlsom, og som gjør bestemt Indtryk af blandet Herkomst.

Et lignende Forhold, som her er nævnt, finder ogsaa Sted paa den amerikanske Side. Der mødes de nordlige og arktiske Former under en langt sydligere Breddegrad, og at dømme efter hvad jeg har seet, er Forvirringen mellem Arterne der end større. Herr Verkrüzen har bragt smukke Svitter af Buccina med sig fra Nyfundland og derimellem har han fundet ikke mindre end 5 nye Arter, hvoraf dog en eller to maaske endnu ikke er beskrevet. De 3 af disse har jeg havt Anledning at se, men omend de neppe vil blive erkjendt for gode Arter, saa er de dog interessante Mellemformer. De store og flittige Skrabninger, som U. S. Fish Commission foretager, vil rimeligvis bringe et stort Materiale sammen, og utvivlsomt kan man vente sig værdifulde Bidrag til denne Slægt derfra, naar det en Gang bliver offentliggjort.

At Tandstrukturen ingen Betydning har som Artskarakter inden *Buccinum* er før nævnt. Der er kun to Tandformer, nemlig *B. undatums* og *B. groenlandicums*, den første med en Centralplade, med 5 til 7 Tænder og Sidepladerne med 4 Tænder; den sidste med en 3- til 5-tandet Centralplade og 3-tandet Sideplade, men forøvrigt gaa begge Tandformer hyppig over i hinanden og er i det Hele taget underkastet stor Foranderlighed.

Paa Pl. V, Fig. 16 & 17, er fremstillet 2 Variationer af *B. undatums* Tænder, og dette maa være nok for at vise, hvor liden Støtte der ligger i denne Karakter. Fig. 16 er i den Grad afvigende fra hele Familiens Tandtype, at den gaar ind paa *Fasciolaridernes* Grændser; Fig. 17 viser, at Tændernes Antal paa Centralpladen hos det selvsamme Individ kan voxe fra 6 i den forreste til 8 i den bageste Del af Radula. *B. groenlandicum* frembyder lige store Variationer i sin Tandbygning.

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limits. Thus, for instance, *B. groenlandicum* is first met with north of the Polar Circle in the European waters of the Atlantic, and here it occurs at first in company with *B. undatum;* but in the true Arctic Seas it wholly supplants that species. And again, *B. finmarchianum* takes the place of the more southerly form, *B. Humphreysianum*, to be in turn succeeded by *B. hydrophanum*.

In the above-mentioned paper, "Ueber die Variationen der Zahnstructur bei *Buccinum*," I ventured to assume that some of the species are hybrids, and founded my assumption on the fact, that transition-forms are found in localities where several species frequently occur together. To give an example: — *B. undatum* and *B. groenlandicum* are both numerous in the littoral zone at Hammerfest, and here the two forms pass completely over into each other. At Spitzbergen, too, a locality in which several species, such as *B. groenlandicum, undulatum, glaciale,* and *Terræ Novæ* occur together, forms will be met with that convey the impression of specific mixture.

The same is the case on the American side. There, the northern and Arctic forms meet much farther south, and, to judge from what I have seen, the confusion of species must be still greater. Mr. Verkrüzen brought home from Newfoundland a rich collection of *Buccina*, comprising among them as many as 5 new species, one or two of which are possibly still undescribed. Three of these new species I have had opportunity of examining, and though their rank as true species may be doubted, they must still be regarded as interesting transition-forms. The frequent and extensive dredging operations carried on by the U. S. Fish Commission, will in all probability bring to light a rich material, and valuable information concerning this genus may unquestionably be expected from that quarter.

That no importance can be attached to the dentition as a specific character in the genus *Buccinum*, has been already stated. There are only two forms of teeth, viz. that in *B. undatum* and in *B. groenlandicum;* the former has the central plate with from 5 to 7 cusps and the laterals with 4 each; the latter has from 3 to 5 cusps on the central plate and 3 on the laterals; for the rest, however, both forms frequently merge into each other, and on the whole the character is exceedingly liable to vary.

In Pl. V, figs. 16, 17, are represented two cases of structural diversity occurring in the teeth of *B. undatum*, amply sufficient to show the untrustworthiness of this character. In fig. 16, the structure differs to that extent from the typical dentition of the family, as to have features in common with those of the *Fasciolaridæ*. Fig. 17 shows that, in one and the same individual the number of cusps on the central plate can increase from 6 at the anterior, to 8 at the posterior, end of the radula. *B. groenlandicum* exhibits as great a structural variation.

Buccinum undatum, Lin.

Syst. Nat., Pag. 1204.

For Varieteternes Vedkommende vil jeg i det Væsentlige holde mig til Prof. G. O. Sars "*Moll. regionis arcticae norvegiae*", da hans fortrinlige Illustrationer ikke lader nogen Tvivl om, hvilke Former der menes.

Forma typica, G. O. Sars.
(l. c. Tab. 24, Fig. 2).

Var. **pelagica**, G. O. Sars.
(l. c. Tab. 24, Fig. 4).

Forekomst: Bodø, Tromsø, Hammerfest, Vardø fra 20 til 40 Favne.

Var. **coerulea**, G. O. Sars.
(l. c. Tab. 24, Fig. 3).

Var. **littoralis**, G. O. Sars.
(l. c. Tab. 13, Fig. 12).

Forekomst: Tromsø, Hammerfest og Vardø littoral, samt i Skjærstadfjord, 30 Favne.

Var. **zetlandica**, Forb.

Forekomst: Stat. 10, 23, 255 og 261. Fra 80 til 341 Favne.

Fra Stat. 23 er 2 Exemplarer; den ene er en typisk *zetlandica*, men den anden har mere bugede Vindinger og nærmer sig til Hovedformen. Exemplarerne fra Stat. 255 er i en semifossil Tilstand og temmelig tykskallede.

Buccinum ciliatum, Fabr.

Tritonium ciliatum, Fabr. Fauna Groenl. Pag. 401.

Forekomst: Stat. 322 paa 21 Favne og Norskøerne (opkastede paa Stranden).

Var. **lævior**, Mørch. Prod. Fauna Groenl.
Tritonium flavulum (Beck, M. S.), Mørch (Cat. Moll. Spitzb., Pag. 13).

Forekomst: Norskøerne paa 10—20 Favne.

Denne glatte Varietet med udslettede Længdefolde er temmelig afvigende fra Typeformen og synes at nærme sig til *B. groenlandicum*, var. *sericatum*, men Sculptur og Epidermis er forskjellig.

Fra Mørch har jeg i sin Tid faaet var. *lævior*, og dermed stemmer Exemplaret fra Norskøerne, kun er Mundaabningen mere udvidet nedad og faar derved en paafaldende Lighed med *Buccinopsis*, men da baade Operculum og Tænder er undersøgte kan der ikke være Tale om nogen Feiltagelse.

Buccinum undatum, Lin.

Syst. Nat., p. 1204.

As regards the varieties of this species, I shall in the main be guided by Professor G. O. Sars in his "*Moll. regionis arcticae norvegiae*," since, with the excellent illustrations to that work, there can be no risk of confounding the forms.

Forma typica, G. O. Sars.
(l. c. Pl. 24, fig. 2).

Var. **pelagica**, G. O. Sars.
(l. c. Pl. 24, fig. 4).

Habitat: — Bodø, Tromsø, Hammerfest, Vardø; from 20 to 40 fathoms.

Var. **coerulea**, G. O. Sars.
(l. c. Pl. 24, fig. 3).

Var. **littoralis**, G. O. Sars.
(l. c. Pl. 13, fig. 12).

Habitat: — Littoral at Tromsø, Hammerfest, and Vardø, and in the Skjærstadfjord; 30 fathoms.

Var. **zetlandica**, Forb.

Habitat: — Stats. 10, 23, 255, and 261; from 80 to 341 fathoms.

Two specimens came up at Stat. 23: one is a typical *zetlandica*, the other has more tumid whorls and approximates the typical form. The specimens from Station 255 are all in a semi-fossil state, and thick-shelled.

Buccinum ciliatum, Fabr.

Tritonium ciliatum, Fabr. Fauna Groenl. p. 401.

Habitat: — Stat. 322, at a depth of 21 fathoms, and the Norway Islands (found on the beach).

Var. **lævior**, Mörch. Prod. Fauna Groenl.
Tritonium flavulum (Beck, M. S.), Mörch (Cat. Moll. Spitzb., p. 13).

Habitat: — The Norway Islands, at a depth of from 10 to 20 fathoms.

This smooth variety, with obliterated longitudinal folds, differs considerably from the typical form, and would appear to approximate *B. groenlandicum*, var. *sericatum*, from which however it is in turn distinguished by the character of the sculpturing and the epidermis.

Dr. Mörch kindly sent me a specimen of var. *lævior*, which agrees well with our specimen from the Norway Islands, save in so far as the latter has the aperture more expanded below, giving it a close resemblance to *Buccinopsis;* but as the operculum and the teeth were both examined, no mistake can be made.

Dr. Leches *Buccinopsis ovum* (Novaja Semlja & Jenisej Hafsmoll. Pag. 59) maa utvivlsomt komme ind under denne Varietet, uagtet han vistnok ogsaa har opført *B. ciliatum*, var. *lævior*, men Tegningerne af Tænderne viser noksom, at han ikke har havt en *Buccinopsis* for sig.

Buccinum groenlandicum, Chmn.

Conch. Cab. X, Pag. 177, Fig. 144.

Forekomst: Tromsø, Hammerfest, Vardø (littoral); Norskøerne, Adventbay, Magdalenbay; fra 10 til 60 Favne.

Paa de 3 sidste Lokaliteter (Spitzbergen) forekom en smuk, baandet Varietet.

Var. **acuta**, nob. Pl. III, Fig. 17

langt uddraget, konisk Spir og flade Vindinger.

Et Exemplar fra Hammerfest (littoral).

Det er maaske nærmere en Monstrositet end Varietet og er noget lignende for *B. groenlandicum* som *accuminatum* for *B. undatum*.

Var. **hybrida**, nob.

Formen konisk, har i Regelen Længdefolde, men mindre stærkt udviklet end hos *B. undatum*. Spiralribberne er paa Tophvirvlerne kraftige, men gaar paa Hovedvindingen som oftest over til obscure Folde; Epidermis haaret.

Hammerfest (littoral).

Denne Form opfatter jeg som en Hybrid imellem *B. undatum* og *groenlandicum*. To Exemplarer fra Hammerfest har Spiret fra *B. undatum*, men Hovedvindingen fra *B. groenlandicum*, nogle andre mangle igjen fuldstændig Længdefolderne, men har dog i sin Sculptur en større Tilnærmelse til *B. undatum*. Der er i det Hele taget den fuldstændigste Overgang imellem begge Arter.

Buccinum conoideum, Sars (l. c. Tab. 24, Fig. 7) holder jeg for at tilhøre den hybride Form, men ligger *B. undatum* nærmest.

Var. **sericata** (?), Tab. III, Fig. 19.

Buccinum sericatum, Hancock. Ann. & Mag. XVIII, Pl. V, Fig. 6.

Stat. 192, 267 og 270; fra 136 til 649 Favne.

Skallen er tynd, halv gjennemsigtig, hvid med stærkt bugede Vindinger. Sculpturen bestaar af tætte, svage Spiral- og Længdestriæ, der danne et fint Netværk over hele Skallen. Epidermis er tæt haaret, næsten ulden.

Dette er ikke Hancocks typiske *B. sericatum*, men adskiller sig fra denne baade i Form og Sculptur. Jeg er forøvrigt aldeles ikke sikker paa, om vi ikke her har en

Dr. Leche's *Buccinopsis ovum* (Novaja Semlja & Jenisej Hafsmoll., p. 59) should unquestionably be referred to this variety, notwithstanding his having also noted *B. ciliatum*, var. *lævior*; but his drawings of the teeth plainly show he has not had a *Buccinopsis* before him.

Buccinum groenlandicum, Chmn.

Conch. Cab. X, pag. 177, fig. 144.

Habitat: — Tromsø, Hammerfest, Vardø (littoral); the Norway Islands, Advent Bay, Magdalena Bay; from 10 to 60 fathoms.

In the 3 last-mentioned localities occurred a finely banded variety.

Var. **acuta**, nob. Pl. III, fig. 17.

very elongate, with a conical spire and flat whorls.

Only one specimen was obtained at Hammerfest (littoral).

This form should perhaps be regarded rather as a monstrosity than a variety; it bears about the same relation to *B. groenlandicum* as does *B. accuminatum* to *B. undatum*.

Var. **hybrida**, nob.

Conical in form, and as a rule with longitudinal folds, though less developed than in *B. undatum*; the spiral ribs prominent on the top whorls, but on the body-whorl generally passing into obscure folds; epidermis hispid.

Hammerfest (littoral).

This form I conceive to be a hybrid between *B. undatum* and *B. groenlandicum*. Two specimens from Hammerfest have the spire as in *B. undatum*, but the head-whorl as in *B. groenlandicum*; in some others the longitudinal folds are wanting altogether, but the sculpture on the shell denotes a nearer approach to *B. undatum*. On the whole, there is an undoubted transition between the two species.

Buccinum conoideum, Sars (l. c., Pl. 24, fig. 7), I regard as a hybrid, approximating closest *B. undatum*.

Var. **sericata** (?), Pl. III, fig. 19.

Buccinum sericatum, Hancock. Ann. & Mag. XVIII, Pl. V, fig. 6.

Habitat: — Stats. 192, 267, 270; from 136 to 649 fathoms.

Shell thin, semi-translucent, white, with tumid whorls. The sculpture occurs as faint and closely disposed spiral and longitudinal striæ, which give to the shell the appearance of a fine network. Epidermis thickly covered with hairs, almost woolly.

This is not Hancock's typical *B. sericatum*, from which it differs alike in form and in the character of the sculpture. For the rest, I am by no means sure it is not a form per-

fra *B. groenlandicum* og Varieteten *sericata* distinct Form, men da der kun er funden 3 døde Exemplarer, kan intet oplyses om Operculum, og det faar derfor staa hen til senere Undersøgelse at afgjøre, hvorvidt den fortjener at separeres.

fectly distinct from *B. groenlandicum* and the var. *sericata*; but 3 examples only having been found, and those dead, there is nothing to record concerning the operculum; and hence subsequent research must decide if this shell has claims to specific distinctness.

Buccinum undulatum, Møll.

Ind. Moll. Groenl., Pag. 84.

Buccinum fragile (Verkr. M. S.), G. O. Sars l. c. Pag. 257, Tab. 24, Fig. 6.

Forekomst: St. 224, 261, 321 og 326; fra 21 til 127 Favne; Norskøerne 10—15 F.

Flere Forfattere og deriblandt Dr. Jeffreys holder Møllers Form for en Varietet af *B. groenlandicum*; derimod anser han *B. fragile* for en Varietet af *B. Belcheri*, Reeve (Last arct. Voy., Pag. 394, Tab. XXXII, Fig. 7 *a*, *b*).

At *B. undulatum* kan nærme sig stærkt til *B. groenlandicum*, har jeg havt Anledning at se, men lige hyppig kan man komme i Tvivl om det ikke er en *B. undatum* Form man har for sig. Undersøgelsen af et stort Antal Exemplarer viser dog, at Tandstrukturen tilhører *Groenlandica* Gruppen.

Verkrüzens Art adskiller sig i intet væsentlig fra Møllers Typeform, som Prof. Steenstrup har havt den Godhed at laane mig til Sammenligning.

Reeves *Belcheri* er en glat Form med fjernede indskaarne Striæ, hvorimod *undulatum* har talrige grove Spiralribber og undertiden imellem disse en fin, samt grove Længdefolder.

B. undulatum er en ægte arktisk Form, der først begynder at optræde i Finmarkens Fjorde østenfor Nordkap.

Buccinum undulatum, Möll.

Ind. Moll. Groenl., p. 84.

Buccinum fragile (Verkr. M. S.), G. O. Sars, l. c., p. 257, Pl. 24, fig. 6.

Habitat: — Stats. 224, 261, 321, 326 from 21 to 127 fathoms; the Norway Islands from 10 to 15 f.

Dr. Jeffreys and several other authors regard Möller's *B. undulatum* as a mere variety of *B. groenlandicum*; *B. fragile*, on the other hand, Dr. Jeffreys conceives to be a variety of *B. Belcheri*, Reeve (Last Arctic Voy., p. 394, Pl. XXXII, fig. 7 *a*, *b*).

B. undulatum often approximates very closely *B. groenlandicum*, but also as frequently *B. undatum*. Meanwhile, the examination of a large number of specimens has shown the dentition to be that of the *groenlandica* group.

In Verkrüzen's species there is no essential difference from Möller's type, which Professor Steenstrup has had the kindness to lend me for comparison.

Reeve's *Belcheri* is a smooth form, with distant striæ, whereas *undulatum* has numerous coarse spiral ribs, or, not infrequently, alternately one coarse and one fine rib, and broad longitudinal folds.

B. undulatum is a true Arctic form, which is first met with in the Finmark Fjords, east of the North Cape.

Buccinum Finmarchianum, Verr.

Jahrb. Mal. Gesell. 1875, Pag. 237, Fig. 1—3.

G. O. Sars, l. c. Pl. 13, Fig. 10, Pl. 25, Fig. 3—4.

Forekomst: St. 261 paa 127 Favne.

Dette er en for Finmarkens Fjorde eiendommelig Form, der visselig fortjener at erkjendes for Art. Tilnærmelser til *B. groenlandicum* forekommer vistnok, men i dette Stykke deler den Skjæbne med de fleste øvrige af Slægtens Arter.

B. pulchellum, G. O. Sars (l. c. Pag. 261, Pl. 24, Fig. 9) er en Varietet af *Finmarchianum*, men passer i alle Dele vel til Mørchs korte Beskrivelse af *B. perdix*,

Buccinum Finmarchianum, Verr.

Jahrb. Mal. Gesell. 1875, p. 237, figs. 1—3.

G. O. Sars, l. c., Pl. 13, fig. 10, Pl. 25, figs. 3—4.

Habitat: — Station 261; 127 fathoms.

This is a form peculiar to the fjords of Finmark, which should unquestionably rank as a species. Approximations to *B. groenlandicum* do indeed occur, but the same is the case with most other species of the genus.

B. pulchellum, G. O. Sars (l. c., p. 261, Pl. 24, fig. 9), is a variety of *Finmarchianum*, agreeing however in all respects with Mörch's brief description of *B. perdix*,

(Beck) Mørch (Cat. Moll. Spitzb., Pag. 14). Hvorvidt imidlertid denne er identisk med Verkrüzens Art har jeg ikke havt Anledning tilfredsstillende at faa undersøgt. Dr. W. Leche (l. c. Pag. 64) holder dem for Synonymer.

Fra *B. Humphreysianum* adskiller den sig ved en grovere Sculptur paa Tophvirvlerne. Udenfor Norge er Arten ikke med Sikkerhed kjendt.

Buccinum Humphreysianum, Bennett.

Zool. Journ. I, Pag. 298, Pl. 30.

Forekomst: Station 195, 107 Favne.

Et ungt dødt, men vel vedligeholdt Exemplar.

Prof. Sars har fundet denne Art i Finmarken, dog kun i smaa, ikke udviklede Exemplarer.

Ovennævnte Station ligger nær under 71de Breddegrad, er Artens yderste kjendte Nordgrændse.

Buccinum hydrophanum, Hancock.

Tab. III, Fig. 20—23.

Buccinum hydrophanum, Hanck. Ann. & Mag. N. H. XVIII, 1846, Pag. 325, Pl. V, Fig. 7.

Forekomst: Stat. 18, 124, 164, 192, 200, 223, 251, 267, 326, 338, 357, 363, 366. Fra 30 til 649 Favne

Den typiske Form er forholdsvis sjelden og forekom *kun paa Stat. 251 — 634 Favne og 366 (Magdalenebay, Spitsbergen) 60 Favne.*

Var. **tumidula,** Fig. 21.

B. tumidulum, G. O. Sars, l. c. *Pag.* 263, Pl. 25, Fig. 5, 6,

og Var. **elata,** nob., Fig. 20.

er de almindeligste Former og findes meget talrig sammen paa de middelmaadige Dyb over hele Ishavet.

Formen *elata* har et langt uddraget Spir og Mundaabningen meget kortere end Spiret.

Var. **Mørchi,** Fig. 22.

B. Mørchi, Friele, "Prelim. Rep." Pag. 4.

Formen konisk, flade Vindinger, violet farvet.

Denne Varietet synes særlig at høre de større Dyb til og forekom paa Stationerne 18, 124, 200, 164 og 192, altsaa imellem 350 og 650 Favne.

(Beck) Mörch (Cat. Moll. Spitzb., p. 14); but whether identical with Verkrüzen's species, I have not had sufficient opportunity of deciding. Dr. W. Leche (l. c., p. 64) regards them as synonyms.

From *B. Humphreysianum* it is distinguished by the coarser sculpturing of the top whorls. Elsewhere than on the coast of Norway, this species has not been recorded with certainty.

Buccinum Humphreysianum, Bennett.

Zool. Journ. I, p. 298, Pl. 30.

Habitat: — Station 195, at a depth of 107 fathoms.

A young specimen, dead, but in a good state of preservation.

Professor G. O. Sars has met with this species in Finmark, but only represented by small and immature examples.

Station 195 lies but a short distance from the 71st parallel of latitude, which constitutes the extreme northern limit of distribution for this species.

Buccinum hydrophanum, Hancock.

Pl. III, figs. 20—23.

Buccinum hydrophanum, Hanck. Ann. & Mag. N. H. XVIII, 1846, p. 325, Pl. V, fig. 7.

Habitat: — Stats. 18, 124, 164, 192, 200, 223, 251, 267, 326, 338, 357, 363, 366; from 30 to 649 fathoms.

The typical form is comparatively rare; it was met with only at Station 251, in 634 fathoms, and at Stat. 366 (Magdalena Bay, Spitzbergen), in 60 fathoms.

Var. **tumidula,** fig. 21.

B. tumidulum, G. O. Sars, l. c., p. 263, Pl. 25, figs. 5, 6,

and Var. **elata,** nob., fig. 20,

are the most frequent forms; they occur abundantly together at moderate depths throughout the whole of the Arctic Ocean.

The form *elata* has a long, produced spire, than which the aperture is much shorter.

Var. **Mörchi,** fig. 22.

B. Mörchi, Friele, "Prelim. Rep.," p. 4.

Form conical, flat whorls, violet-coloured.

This variety would appear to occur chiefly in the deeper strata; it was brought up at Stats. 18, 124, 200, 164, and 192, from depths varying between 350 and 650 fathoms.

Fra Stat. 366 (Magdalenebay) haves 2 Exemplarer, der er afvigende paa en høist eiendommelig Maade. Operculum er hos *hydrophanum* rundt, lidet og dets Gjennemsnit i Regelen mindre, men aldrig større end halve Mundaabningens; Nucleus er central eller ubetydelig til Siden. Hos hine to er derimod Operculum paafaldende større end det normale, og for det ene Exemplars Vedkommende er det et ægte *B. groenlandicum* Operculum. Et af Exemplarerne har en Kjøl rundt sidste Vinding noget nedenfor Periferien.

Ægkapslerne (Fig. 23) ere enten enkelte eller nogle faa sammenvoxne. Overfladen er fint punkteret og ligner nærmest Appelsinens Ydre.

Tænderne ligne *B. groenlandicums*.

Buccinum nivale, n. sp.

Tab. III, Fig. 24, 25 *a*, *b*.

Testa ovata, tenuis, nivea, anfractibus 5 (?) tumidis, ultimo magno et ventricoso, apertura magna, ovata, epidermide laevi. Superficies ubique striis spiralibus densis tenuibus striisque incrementi numerosis, irregularibus sculpta, operculo parvo, ovali, nucleo subterminali.

Magn. long. 11mm, lat. 9mm.

Station 164 — 457 Favne.

Der er kun fundet et ungt, men levende Exemplar af denne Form. Skallen adskiller sig ikke i noget væsentlig fra *B. hydrophanum*, naar undtages den snehvide Farve, og maaske er det kun en Varietet af denne. Men høist eiendommelig er *Operculum* (Fig. 25 *a*, *b*); det er ovalt, har Nucleus henimod nedre Ende, Undersiden (Fig. 25 *b*) har en bred, noget fortykket Rand og Væxtlinierne er kun synlig igjennem Midtpartiet.

Tænderne give som sædvanlig ingen Oplysninger; de ligne *B. groenlandicums*.

Buccinum sulcatum, n. sp.

Tab. III, Fig. 18.

Testa tenuis, nitida, violacea, conica, anfractibus 6 planis, aequaliter crescentibus, sutura minus conspicua, apertura ovata, utrinque acuminata, dimidiam fere testae longitudinem aequante, columella recta, plicis 2 leviter impressis. Superficies costis spiralibus crassis, in anfractu penultimo 4, una vel in superiore anfractus parte pluribus tenuioribus interpositis, striisque incrementi densis, sed obsoletis sculpta, epidermide laevi.

From Stat. 366 there are 2 specimens differing remarkably from the typical form. The operculum in *hydrophanum* is round and small, with a diameter as a rule less, never greater, than half the length of the opening of the mouth, the nucleus being central, or nearly so. In the two aforesaid specimens, the operculum is, on the other hand, very considerably larger than that of the normal form, nay, in one of them, it cannot be distinguished from the operculum in *B. groenlandicum*. The other specimen is keeled round the last whorl, a little below the peripheral line.

The *egg-capsules* (fig. 23) either simple or a few only grown together. Surface delicately punctured, causing it to resemble the rind of an orange.

Dentition as in *B. groenlandicum*.

Buccinum nivale, n. sp.

Pl. III, figs. 24, 25 *a*, *b*.

Testa ovata, tenuis nivea, anfractibus 5 (?) tumidis, ultimo magno et ventricoso, apertura magna, ovata, epidermide laevi. Superficies ubique striis spiralibus densis tenuibus striisque incrementi numerosis, irregularibus sculpta, operculo parvo ovali, nucleo subterminali.

Magn. long. 11mm, lat. 9mm.

Habitat: — Station 164, in 457 fathoms.

Only one specimen, young but living, was obtained. The shell does not exhibit any material difference from that in *B. hydrophanum*, of which *B. nivale* is perhaps a mere variety. But the *operculum* (fig. 25 *a*, *b*) has very peculiar features; it is oval in form, with the nucleus near the lower extremity, the under surface (fig. 25 *b*) furnished with a broad, somewhat inspissated margin, and the lines of growth visible through the medial portion only.

Nothing, as usual, to be learnt from the structure of the teeth, which is similar to that in *B. groenlandicum*.

Buccinum sulcatum, n. sp.

Pl. III, fig. 18.

Testa tenuis, nitida, violacea, conica, anfractibus 6 planis, aequaliter crescentibus, sutura minus conspicua, apertura ovata, utrinque acuminata, dimidiam fere testae longitudinem aequante, columella recta, plicis 2 leviter impressis. Superficies costis spiralibus crassis, in anfractu penultimo 4, una vel in superiore anfractus parte pluribus tenuioribus interpositis, striisque incrementi densis, sed obsoletis sculpta, epidermide laevi.

Magn. long. 27mm, lat. 14mm, apert. long. 14mm, diam. max. $6^1/_2$mm.

Forekomst: Stat. 192 — 649 Favne.

Der er kun fundet et større og et ganske lidet Exemplar, men begge døde. Hvorvidt man her har en ny Art for sig eller en Varietet af en af de bekjendte, er vanskelig at sige. Dens nærmeste Slægtning maatte vel være *B. Finmarchianum* eller *hydrophanum*, idet den glatte, glindsende Epidermis og koniske Form ligne paa Varieteter af disse Arter, men Sculpturen er saa væsentlig afvigende, at den har ingen Sammenligningspunkter.

Dr. Jeffreys skriver til mig, at han har denne Form fra "Porcupine" Exped. 1869 Stat. 65 — 345 Favne, "but consider it *B. groenlandicum*, var. (perhaps *Finmarchianum*)." Det forekommer mig dog at være en Støtte for Formens Artsberettigelse, at den optræder uforandret paa saa forskjellige Punkter.

Magn. long. 27mm, lat. 14mm, apert. long. 14mm, diam. max. $6^1/_2$mm.

Habitat: — Station 192, in 649 fathoms.

Only two specimens were obtained, one a comparatively large and the other a very small individual, and both dead. Whether this form represent a new species, or merely a variety of one of those already known, is difficult to decide. It resembles some varieties of *B. Finmarchianum* or *hydrophanum* in the conical form and smooth, glistening epidermis; but the sculpture is wholly different, with not a single approximating feature.

Dr. Jeffreys writes me, that he has *B. sulcatum* from the "Porcupine" Expedition, 1869, Station 65, at 345 fathoms, "but regards it as *B. groenlandicum*, var. (possibly *B. Finmarchianum*)." The occurrence in so different localities seems to me to be a proof in favour of the specific distinctness of this form.

Buccinum Terræ Novæ, Beck.

Tab. III. Fig. 13—16.

Tritonium Terræ Novæ (Beck) Mørch. Cat. Moll. Spitzb. Pag. 14.
Buccinum Donovani, Reeve. Conch. icon. Fig. 2.
B. undatum, var. *clathratum*, S. Wood. Supp. to the Crag. Moll. Pag. 18, Tab. II, Fig. 3 *a*, *b*.
B. Terræ Novæ, Leche, l. c. Pag. 61, Tab. II, Fig. 33.
B. Totteni, Friele. Cat. d. Spitzb. Moll. Pag. 278.

Forekomst: Stat. 366 og 374. Fra 20 til 60 Favne.

I min "Catalog d. Spitzb. Moll." har jeg opført denne Form under Stimpson's *B. Totteni*. Jeg er vistnok ikke bleven overbevist om, at dette er feilagtig, men efter at have seet en Del mere af den nordamerikanske Form, er jeg bleven tvivlende om det er praktisk heldigt at slaa disse to sammen. At de kan gaa over i hinanden, derom har jeg overbevist mig, men saa findes der ogsaa Overgange til *groenlandicum*, og skal man være streng i Artsbegrebet inden denne Slægt, bliver der ikke mange Arter tilbage.

Neppe nogen Art er saa stærkt varierende som denne, hvad man ogsaa kan dømme efter de 3 afbildede Exempl. Fig. 13, 14 og 15, der alle er taget paa samme Lokalitet, nemlig Adventbay (Spitsbergen).

Som Regel har den grove Spiralribber og imellem disse ligge talrige finere; hos alle mine Exemplarer findes der Længdefolde paa Tophvirvlerne, der igjen forsvinde paa Hovedvindingen. Den secundære Striering bestaar af yderst fine, meget tætte Spiralstriæ, der er svagt bølgende eller næsten chagrineret, fremkommen ved at krydses af talrige fine Væxtlinier. Denne mikroskopiske Sculptur findes ogsaa

Buccinum Terræ Novæ, Beck.

Pl. III, figs. 13—16.

Tritonium Terræ Novæ (Bech) Mörch. Cat. Moll. Spitzb., p. 14.
Buccinum Donovani, Reeve. Conch. icon., fig. 2.
B. undatum, var. *clathratum*, S. Wood. Supp. to the Crag. Moll., p. 18, Pl. II, fig. 3 *a*, *b*.
B. Terræ Novæ, Leche, l. c., p. 61, Pl. II, fig. 33.
B. Totteni, Friele. Cat. d. Spitzb. Moll., p. 278.

Habitat: — Stats. 366, 374; from 20 to 60 fathoms.

In my "Catalog d. Spitzb. Moll.," this form is referred to Stimpson's *B. Totteni*, and I am not as yet convinced that in so doing I was mistaken; but having since seen a good many more North American specimens, I think it most practical to leave these two forms, *B. Terræ Novæ* and *B. Totteni*, specifically separated. That they do sometimes merge into each other, I have satisfied myself; but there are also transition-forms to *groenlandicum*; and if a searching criticism be applied to the species of this genus, few would indeed be left.

There is not, perhaps, another species of the genus that varies to such an extent, as a glance at the 3 specimens represented in figs. 13, 14, and 15 — all of them from the same locality (Advent Bay, Spitzbergen) — will suffice to show.

As a rule, the shell is sculptured with coarse spiral ribs, or carina, between which are numerous finer ones. All of my specimens have the top whorls with longitudinal folds, which disappear on the body-whorl. The secondary striation consists of exceedingly delicate, closely disposed spiral striæ, which, being intersected by numbers of delicate lines of growth, give an almost shagreened appearance to

hos *B. Totteni,* men er Epidermis borte, lader den sig vanskelig iagttage.

Mr. R. Bell har havt den Godhed at overlade mig et Exemplar af *B. undatum,* var. *clathratum,* S. Wood, fra den engelske Crag, og der kan ikke være Tvivl om, at denne maa henføres under nærværende Art.

Ægkapslerne (Fig. 16 *a, b*) er omtalte af Mørch i "Cat. des Moll. du Spitzb.", Pag. 16 (Ootheca No. 1), uden dog at være henført til nogen bestemt Art. Oothecas Form er lang, cylindrisk, snart som en enkelt Stamme, snart med en paa Siden udskydende Gren. Længden er omtrent 100mm og Bredden 16—20mm.

Kapslernes Form er oval med nedhængende bred Rand (Formen kan bedst lignes med Sømandens "Sydvest"); er sammenvoxne langs Siderne og staa arrangerede i Spiral rundt en Axe.

Arten er kun kjendt fra Grønland og Ishavet.

Buccinum glaciale, Lin.

B. carinatum, Phipps Voy. Pag. 201, Tab. XIII, Fig. 2.
B. polare, Gray. Beechey's Voy. Pag. 128.
B. Donovani, „ — „ „ „

Forekomst: Jan Mayen, Stat. 322, 366, 374, Norskøerne. Fra 10 til 60 Favne.

Alle Varieteter, saasom *unicarinata, bicarinata, tricarinata, Hancocki* (Mørch) og *Donovani* forekomme om hinanden.

Formen *angulosum,* Gray (Beechey's Voy. Pag. 127, Tab. XXXVI, Fig. 6) blev ikke funden paa den norske Expedition. Flere Forfattere vil opretholde denne som en god Art, men efterat have gjort mig bekjendt med Typeexemplaret i British Museum, maa jeg samstemme med Dr. Jeffreys, at den kun kan ansees for en Varietet af *glaciale;* thi hos begge gjenfinder man den samme fine mikroskopiske Sculptur, nemlig yderst tætte fine Spiralstriæ. *B. angulosum* synes at være en lignende Afart af *glaciale* som *Neptunea borealis* af *despecta.*

Ægkapslerne ere samlede i uregelmæssig formede Klaser, er mindre end *undatums* og har et rynket Udseende. Embryonerne ere glatte og kun sjelden ser man en svag Antydning til Carina; Spiralstrieringen er yderst fin, kun synlig under en vis Belysning.

the surface of the shell. The same microscopic sculpturing occurs, too, in *B. Totteni,* but is difficult to detect should the epidermis be gone.

Mr. R. Bell has had the kindness to present me with a specimen of *B. undatum,* var. *clathratum,* S. Wood, from the English Crag, which is unquestionably identical with the present species.

The *egg-capsules* (fig. 16 *a, b*) have been described by Mörch in "Catal. des Moll. du Spitzb.," p. 16 (Ootheca No. 1), without however his referring them to any particular species. Ootheca is long and cylindrical in form, occurring now as a naked stem, now with a projecting branch. Length about 100mm, breadth from 16mm to 20mm.

The capsules are of an oval form, with a broad pendent margin, and may be best likened to a sailor's sou' wester. They are grown together at the sides, and spirally arranged round an axis.

The species is known only from Greenland and the Polar Sea.

Buccinum glaciale, Lin.

B. carinatum, Phipps's Voy., p. 201, Pl. XIII, fig. 2.
B. polare, Gray. Beechey's Voy., p. 128.
B. Donovani, „ — „ „ „

Habitat: — Jan Mayen, Stats. 322, 366, 374, Norway Islands; from 10 to 60 fathoms.

All the varieties, viz. *unicarinata, bicarinata, tricarinata, Hancocki* (Mörch), and *Donovani,* occur in the same localities.

The form *angulosum,* Gray (Beechey's Voy., p. 127, Pl. XXXVI, fig. 6), was not met with on the Norwegian Expedition. Some authors maintain this to be a distinct species, but having examined the typical specimen in the British Museum, I cannot but agree with Dr. Jeffreys in regarding it as a variety of *glaciale;* for in both forms occurs precisely the same microscopic sculpture — delicate and exceedingly close spiral striæ. *B. angulosum* appears to bear the same relation to *glaciale* as does *Neptunea borealis* to *N. despecta.*

The *egg-capsules* — arranged in irregular clusters — are smaller than those of *undatum,* and have a wrinkled appearance. The embryos smooth, but rarely with any faint indication of a carina; spiral striature exceedingly delicate, and visible only under a certain light.

Buccinum tenue, Gray.

Beechey's Voy. 1839, Pag. 128, Pl. XXXVI, Fig. 19.
B. scalariforme (Beck) Møller. Ind. Moll. Groenl. 1842, Pag. 84.

Forekomst: — Stat. 326, 357, Norskøerne (20—30 Favne), 366, 374. Fra 20 til 125 Favne.

I sin ydre Form er ogsaa denne Art stærkt varierende og Forholdet imellem Spiret og Mundaabningen vexler, fra Mundaabningen $^{2}/_{3}$ af Spiret til over Spirets Længde. I Regelen er Vindingerne stærkt tumide med dyb Sutur, men fra Magdalenebay (Stat. 366) haves et Exemplar, der i ydre Form ligner den almindelige *B. groenlandicum*, og Længdefoldene er kun svagt udviklet, men den eiendommelig fine chagrainerede Sculptur kommer dog tydelig frem. Dr. Leche omtaler derimod i sit oftere citerede Arbeide (Pag. 65) en Varietet med "tydelig udviklet Kjøl" og tilføier: "Saavel paa Grund af denne Karakter som ogsaa ved hele sin Form synes denne Varietet at danne Overgang til *B. undulatum*, Møll." *(B. Donovani?)*.

Om end denne Art utvivlsomt hører til de bedste Buccinum-Arter, saa synes ogsaa her imellem at forekomme Former, der tyder paa en ikke ganske ren Herkomst.

Da nærværende Afhandling i Januar 1881 blev indleveret til Redaktionskomiteen, betragtede jeg den som afsluttet fra min Haand, og de mange større og mindre Arbeider over *Buccinidæ*, som senere er bleven offentliggjort, har jeg derfor ikke kunnet tage Hensyn til. I intet væsentlig har disse dog forandret mine Anskuelser saaledes, at jeg har fundet noget Omarbeide nødvendig, og lige saa lidt er de af mig opstillede nye Arter, saavidt mig bekjendt, beskrevet af senere Forfattere. Her skal forøvrigt oplyses, at Separataftryk af Plancherne allerede i August 1880 blev sendt til malacologiske Venner i Europa og Amerika.

Buccinum tenue, Gray.

Beechey's Voy. 1839, p. 128, Pl. XXXVI, fig. 19.
B. scalariforme (Beck) Möller, Ind. Moll. Groenl. 1842, p. 84.

Habitat: — Stats. 326, 357, Norway Islands (20—30 faths.), 366, 374 (20—125 faths.).

This form varies, too, very considerably in its outer characters. The proportions between the spire and the aperture, for instance, vary from the aperture being two-thirds to more than the length of the spire. The whorls are as a rule very tumid, with a deep suture; but a specimen from Magdalena Bay (Stat. 366) resembles in its habitus the normal form of *B. groenlandicum*, the longitudinal folds being but slightly developed, whereas the delicate granulous secondary sculpturing is distinctly perceptible. Dr. Leche mentions in his aforecited work, p. 65, a variety with "a distinctly developed keel." "Both by reason of this character and of its general form, the said species would appear to approximate *B. undulatum*, Möll." *(B. Donovani?)*.

Even in this, though unquestionably one of the best-defined species of the genus, forms do, it seems, occasionally occur indicating a spurious descent.

The present Memoir having been forwarded to the Editorial Committee in January 1881, I considered it as finished from my pen, and to the numerous works on the *Buccinidæ*, as well extensive as brief, that have since appeared, I cannot therefore have due regard. None of these, however, have affected my views to such extent, that I have seen fit to re-write any portion of the Memoir; nor have the new species I have established, so far as I am aware, been described by any subsequent author. For the rest, I can state here, that copies of the plates were distributed among malacological friends in Europe and America as early as August 1880.

Translated into English by **John Hazeland.**

Forklaring over Tavlerne.

Tab. I, Fig. 1. *Jumala Ossiana*, Friele.
— 2. — Operculum.
— 3. — Apex.
— 4. — ungt Individ.
— 5. — Ægkapsel.
— 6 *a, b.* — Embryo.
— 7 *a, b.* *Neptunea despecta*, L., Embryo.
— 8. *Neptunea (Pyrolofusus) deformis*, Reeve, Operculum.
— 9. *Neptunea (Sipho) islandica*, Chemn., Ægkapsel.
— 10 *a, b.* — — Embryo.
— 11 *a, b.* — — ungt Individ.
— 12 *a, b, c.* — — Apex.
— 13—14. *N. (Sipho) turgidula*, Jeffr.
— 15 *a, b, c.* — — Apex.
— 16. — — Operculum.
— 17 *a, b.* — — ungt Individ.
— 18. — — Dyret.
— 19 *a, b, c.* *N. (Sipho) gracilis*, da Cost, Apex.
— 20. *N. (Sipho) Hanseni*, Friele.
— 21, 22. *N. (Sipho) virgata*, Friele.
— 23. — — Dyret.
— 24 *a, b.* — — Apex.
— 25. — — Operculum.
— 26. *N. (Sipho) curta*, Jeffr., Dyret.
Tab. II, Fig. 1 til 6. *Neptunea (Sipho) curta*, Jeffr.
— 7 *a, b, c, d.* — — Apex.
— 8. — — Operculum.
— 9. — — ungt Individ.
— 10. — — Ægkapsel.
— 11 *a, b.* — — Embryo.
— 12. *N. (Sipho) Kroyeri*, Møll., Operculum.
— 13 *a, b.* — — Apex.
— 14 *a, b.* — — Embryo.
— 15 *a.* — — ungt Individ.
— 15 *b.* — — Apex af samme.
— 16 *a, b.* *N. (Sipho) latericea*, Møll., ungt Individ.
— 17 *a, b.* — — Apex.

Explanation of the Plates.

Pl. I, figs. 1. *Jumala Ossiana*, Friele.
— 2. — operculum.
— 3. — apex.
— 4. — a young individual.
— 5. — egg-capsule.
— 6 *a, b.* — embryo.
— 7 *a, b.* *Neptunea despecta*, L., embryo.
— 8. *Neptunea (Pyrolofusus) deformis*, Reeve, operculum.
— 9. *N. (Sipho) islandica*, Chemn., egg-capsule.
— 10 *a, b.* *N. (Sipho) islandica*, embryo.
— 11 *a, b.* — — a young individual.
— 12 *a, b, c.* — — apex.
— 13—14. *N. (Sipho) turgidula*, Jeffr.
— 15 *a, b, c.* — — apex.
— 16. — — operculum.
— 17 *a, b.* — — a young individual.
— 18. — — the animal.
— 19 *a, b, c.* *N. (Sipho) gracilis*, da Cost, apex.
— 20. *N. (Sipho) Hanseni*, Friele.
— 21—22. *N. (Sipho) virgata*, Friele.
— 23. — — the animal.
— 24 *a, b.* — — apex.
— 25. — — operculum.
— 26. *N. (Sipho) curta*, Jeffr., the animal.
Pl. II, figs. 1 to 6. *Neptunea (Sipho) curta*, Jeffr.
— 7 *a, b, c, d.* — — apex.
— 8. — — operculum.
— 9. — — a young individual.
— 10. — — egg-capsule.
— 11 *a, b.* — — embryo.
— 12. *N. (Sipho) Kroyeri*, Möll., operculum.
— 13 *a, b.* — — apex.
— 14 *a, b.* — — embryo.
— 15 *a.* — — a young individual.
— 15 *b.* — — apex of same spec.
— 16 *a, b.* *N. (Sipho) latericea*, Möll., a young individual.
— 17 *a, b.* — — apex.

Tab. II, Fig. 18. *Neptunea* (*Siphonorbis*) *Dalli*, n. sp.
— 19. — — Apex.
— 20. *N.* (*Siphonorbis*) *ebur*, Mørch.
— 21. — — var. *Sarsi*, Jeffr.
— 22. — — Apex.
— 23 *a*. — — Operculum.
— 23 *b*. — — do. af et ikke fuldt udviklet Exemplar.
— 24. *N.* (*Siphonorbis*) *turrita*, M. Sars, Operculum.
— 25. — — Apex.
— 26 *a*, *b*. — — et meget ungt Individ.
— 27. — — Ægkapsler fæstet til *Astarte crenata*, Gr.
— 28. *N.* (*Siphonorbis*) *lachesis*, Mørch.
— 29. — — var. *bicarinata*, Friele.
— 30. — — Apex.
— 31. — — Operculum.
— 32 *a*, *b*. — — unge Individer.
— 33. *N.* (*Siphonorbis*) *undulata*, n. sp.
— 34. — — Apex.
— 35. — — Operculum.

Tab. III, Fig. 1, 2. *Neptunea* (*Siphonorbis*) *Danielsseni*, Friele.
— 3. — — Apex.
— 4. — — Operculum.
— 5 *a*, *b*. — — Embryo.
— 6. — — Ægkapsel fæstet til et Sabellarør.
— 7, 8. *Neptunea* (*Mohnia*) *Mohni*, Friele.
— 9. — — Apex.
— 10. — — Operculum.
— 11 *a*, *b*. — — Embryo.
— 12 *a*, *b*. *Troschelia Berniciensis*, King (?) Embryo.
— 13,14,15. *Buccinum Terræ-Novæ*, Mørch.
— 16 *a*, *b*. — — *Ootheca.*
— 17. *B. groenlandicum* var. *acuta*, Friele.
— 18. *B. sulcatum*, n. sp.
— 19. *B. groenlandicum* var. *sericata*, Hanc. (?).
— 20. *B. hydrophanum*, var. *elata*, Friele.
— 21. — var. *tumidula*, G. O. Sars.
— 22. — var. *Mörchi*, Friele.
— 23. — Ægkapsler.
— 24. *B. nivale*, n. sp.
— 25 *a*, *b*. — Operculum.

Tab. IV, Fig. 1 til 3. Tandformer hos *Jumala Ossiani*, Fr.
— 4 til 7. — „ *J. Turtoni*, Bean.
— 8 til 10. — „ *Neptunea despecta*, L.
— 11 til 13. — „ *N.* (*Pyrolofusus*) *deformis*, Reeve.
— 14 til 18. — „ *N.* (*Sipho*) *turgidulus*, Jeffr.

Tab. V, Fig. 1 til 3. — „ *N.* (*Siphonorbis*) *ebur*, Mørch.

Pl. II, fig. 18. *Neptunea* (*Siphonorbis*) *Dalli*, n. sp.
— 19. — — apex.
— 20. *N.* (*Siphonorbis*) *ebur*, Mörch.
— 21. — — var. *Sarsi*, Jeffr.
— 22. — — apex.
— 23 *a*. — — operculum.
— 23 *b*. — — do. of an immature specimen.
— 24. *N.* (*Siphonorbis*) *turrita*, M. Sars, operculum.
— 25. — — apex.
— 26 *a*, *b*. — — a very young individual.
— 27. — — egg-capsules attached to *Astarte crenata*, Gr.
— 28. *N.* (*Siphonorbis*) *lachesis*, Mörch.
— 29. — — var. *bicarinata*, Friele.
— 30. — — apex.
— 31. — — operculum.
— 32 *a*, *b*. — — young individuals.
— 33. *N.* (*Siphonorbis*) *undulata*, n. sp.
— 34. — — apex.
— 35. — — operculum.

Pl. III, figs. 1, 2. *Neptunea* (*Siphonorbis*) *Danielsseni*, Fr.
— 3. — — apex.
— 4. — — operculum.
— 5 *a*, *b*. — — embryo.
— 6. — — egg-capsule attached to the tube of a *Sabella*.
— 7, 8. *Neptunea* (*Mohnia*) *Mohni*, Friele.
— 9. — — apex.
— 10. — — operculum.
— 11 *a*, *b*. — — embryo.
— 12 *a*, *b*. *Troschelia Berniciencis*, King (?), embryo.
— 13,14,15. *Buccinum Terræ Novæ*, Mörch.
— 16 *a*, *b*. — — *Ootheca.*
— 17. *B. groenlandicum*, var. *acuta*, Friele.
— 18. *B. sulcatum*, n. sp.
— 19. *B. groenlandicum* var. *sericata*, Hanck. (?)
— 20. *B. hydrophanum* var. *elata*, Friele.
— 21. — var. *tumidula*, G. O. Sars.
— 22. — var. *Mörchi*, Friele.
— 23. — egg-capsules.
— 24. *B. nivale*, n. sp.
— 25 *a*, *b*. — operculum.

Pl. IV, figs. 1 to 3. Dentition in *Jumala Ossiani*, Fr.
— 4 to 7. — „ *J. Turtoni*, Bean.
— 8 to 10. — „ *Neptunea despecta*, L.
— 11 to 13. — „ *N.* (*Pyrolofusus*) *deformis*, Reeve.
— 14 to 18. — „ *N.* (*Sipho*) *turgidulus*, Jeffr.

Pl. V, figs. 1 to 3. — „ *N.* (*Siphonorbis*) *ebur*, Mörch.

Tab. V, Fig. 4, 5. Tandformer hos *N.* (*Siphonorbis*) *turrita*, M. Sars.
— 6, 7. — „ *N.* (*Siphonorbis*) *lachesis*, Mørch.
— 8. — „ *N.* (*Siphonorbis*) *undulata*, n. sp.
— 9 til 13. — „ *N.* (*Siphonorbis*) *Danielsseni*, Fr.
— 14, 15. — „ *N.* (*Mohnia*) *Mohni*, Fr.
— 16, 17. — „ *Buccinum undatum*, L.
Tab. VI, Fig. 1, 2. — „ *Neptunea* (*Sipho*) *islandica*, Chmn.
— 3, 4. — „ *N.* (*Sipho*) *virgata*, Fr.
— 5 til 10. — „ *N.* — *curta*, Jeffr.
— 11 til 15. — „ *N.* — *Kroyeri*, Møll.
— 16. — „ *N.* — *latericea*, Møll.

Pl. V, figs. 4, 5. Dentition in *N.* (*Siphonorbis*) *turrita*, M. Sars.
— 6, 7. — „ *N.* — *lachesis*, Mörch.
— 8. — „ *N.* — *undulata*, n. sp.
— 9 to 13. — „ *N.* — *Danielsseni*, Fr.
— 14, 15. — „ *N.* (*Mohnia*) *Mohni*, Fr.
— 16, 17. — „ *Buccinum undatum*, L.
Pl. VI, figs. 1, 2. — „ *Neptunea* (*Sipho*) *islandica*, Chemn.
— 3, 4. — „ *N.* (*Sipho*) *virgata*, Fr.
— 5 to 10. — „ *N.* — *curta*, Jeffr.
— 11 to 15. — „ *N.* — *Kroyeri*, Möll.
— 16. — „ *N.* — *latericea*, Möll.

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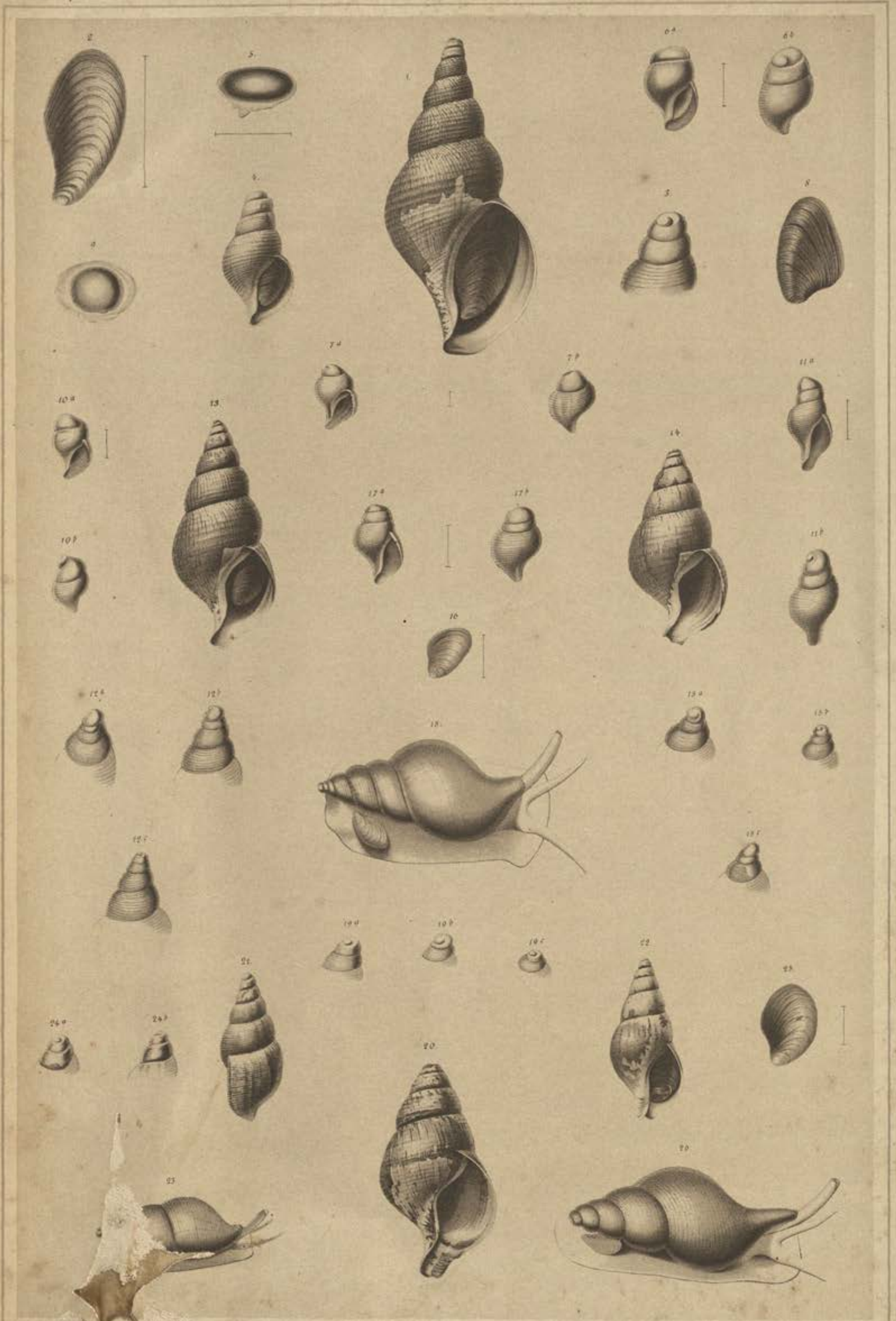

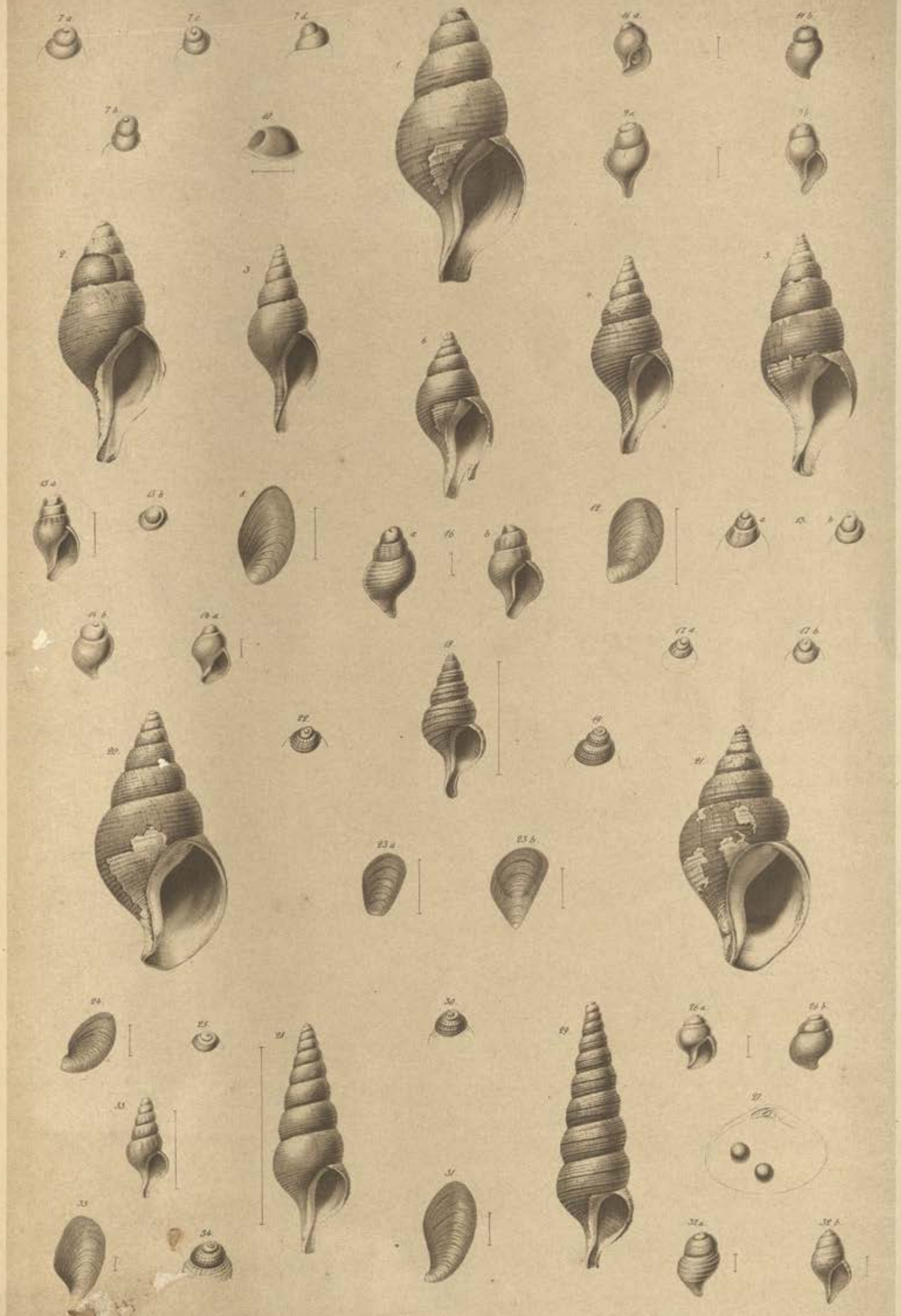

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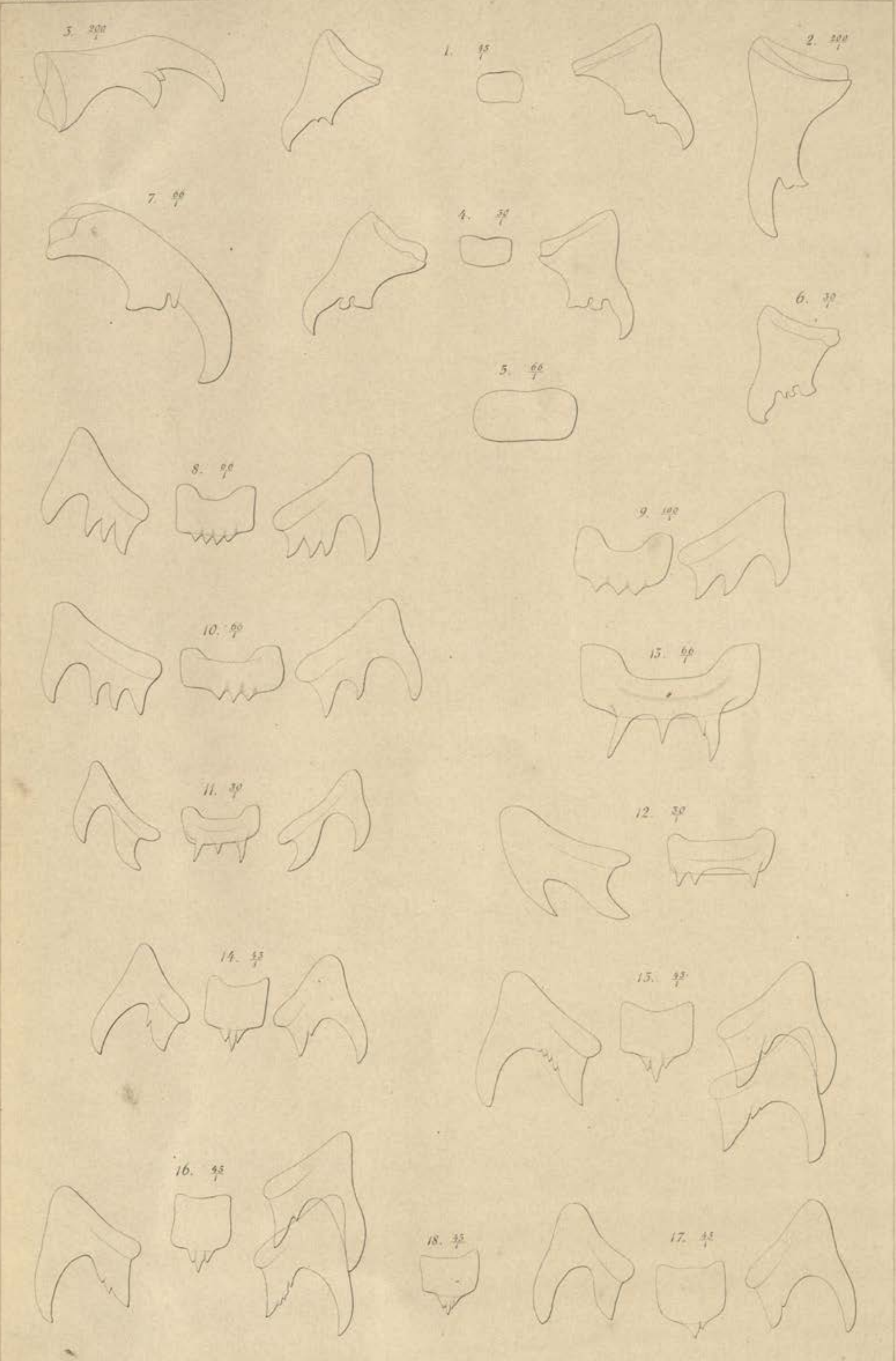

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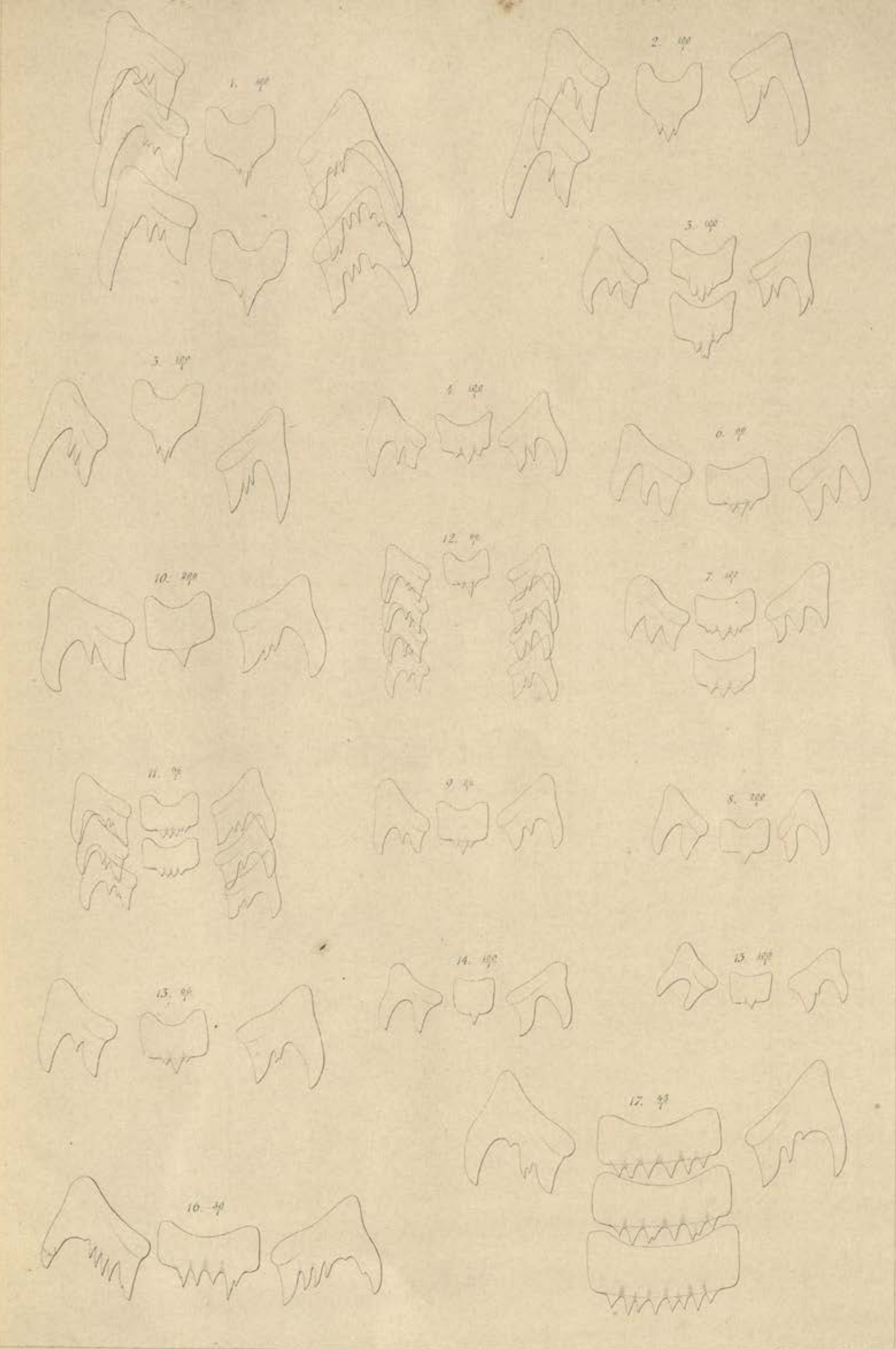

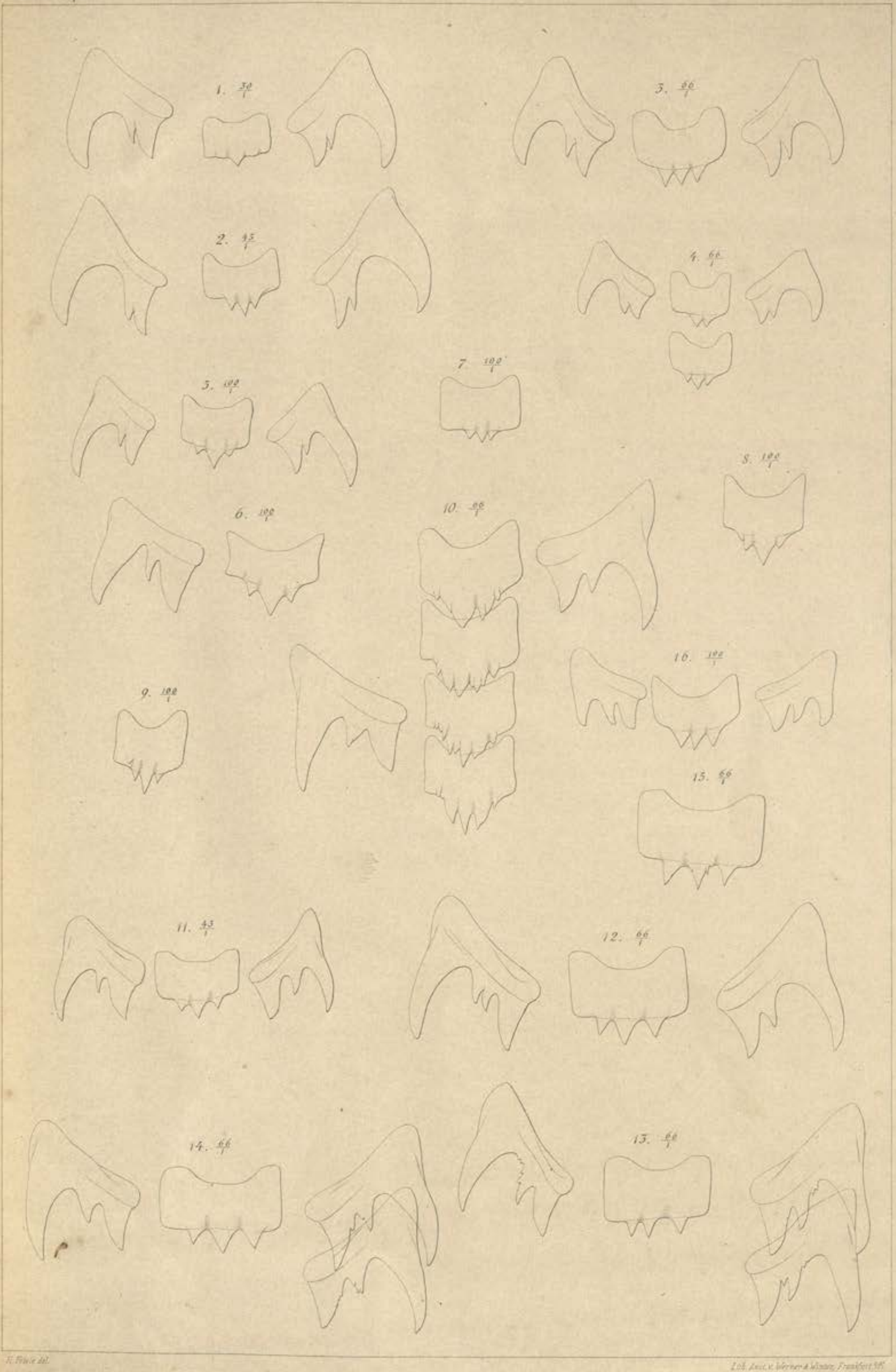
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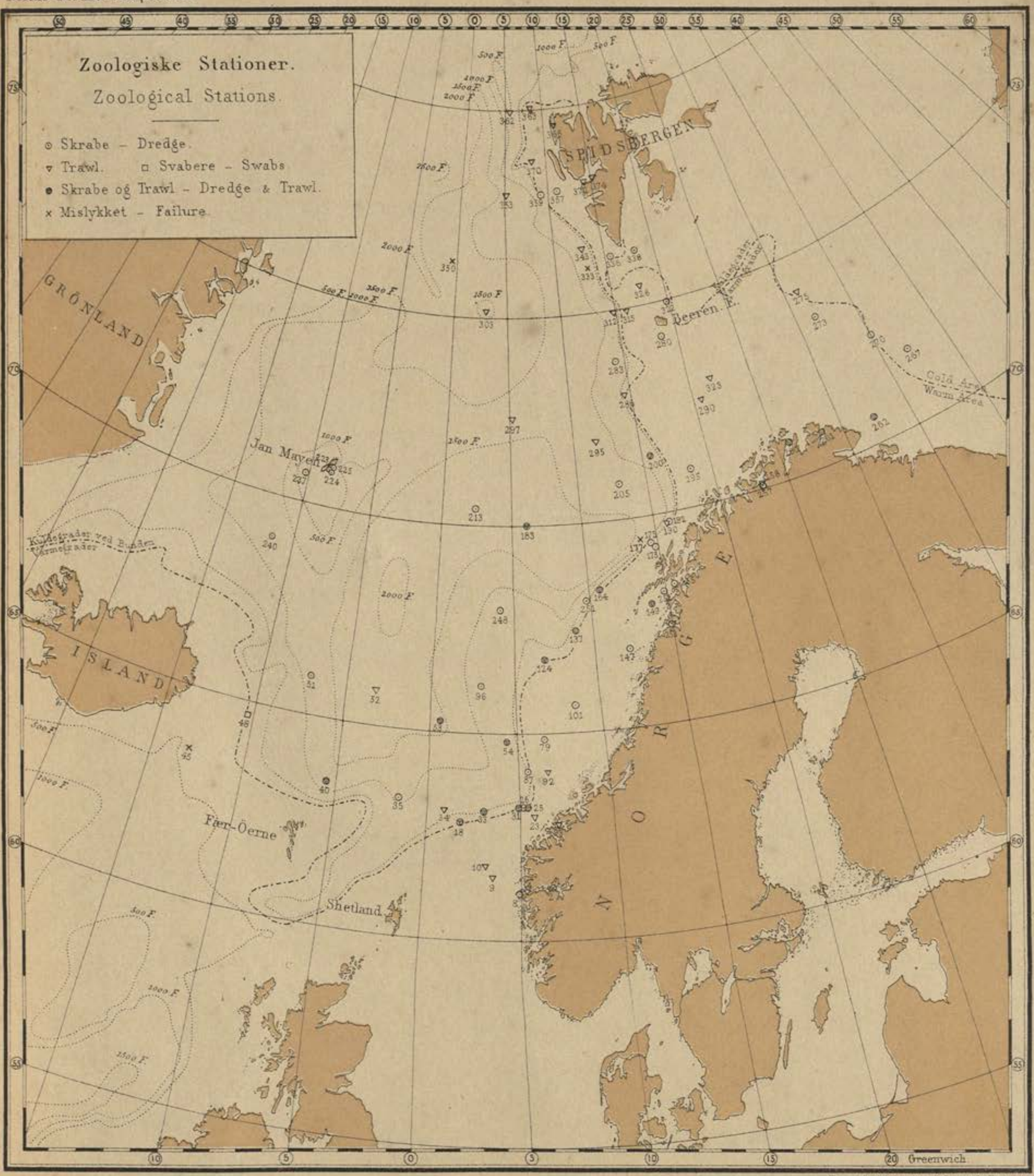

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DEN NORSKE NORDHAVS-EXPEDITION 1876—1878.

ZOOLOGI.

MOLLUSCA.

II.

VED

HERMAN FRIELE.

MED 6 PLANCHER.

CHRISTIANIA.
GRØNDAHL & SØNS BOGTRYKKERI.
1886.

THE NORWEGIAN NORTH-ATLANTIC EXPEDITION 1876—1878.

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MOLLUSCA.

II.

BY

HERMAN FRIELE.

WITH 6 PLATES.

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Pleurotomidæ.

Gen. **Bela** Leach.

Ved Bestemmelsen af Arterne inden denne Slægt maa man uundgaaelig lægge til Grundlag Prof. G. O. Sars's Værk „*Mollusca regionis arcticæ Norvegiæ*"; thi der er intet tidligere Arbeide, hvori disse nærstaaende Arter saa nøie er gransket og hvori er givet saa omhyggelige Tegninger, der gjør en Identificeren mulig.

Prof. Sars har lagt en afgjørende Vægt for Artsbestemmelsen i Piltændernes Struktur og omend jeg maa indrømme, at enhver Karakter, der er konstant, den være taget fra Dyrets indre eller ydre, er berettiget som Artsmærke, saa er det paa den anden Side lidet tilfredsstillende for Conchologen kun at have med indre anatomiske Karakterer at gjøre og man kan ikke være tjent med at lade et dødt, men velbevaret Exemplar henligge ubestemt, fordi Tandbygningen ikke har været undersøgt. Ensidig indre Karakterer er ikke praktiske. Tandstrukturens Stabilitet maa man ogsaa kunne overse før man kan indrømme en Arts Berettigelse, hvor der er Brist paa tilfredsstillende ydre Skillemærke.

Jeg har gjort mig til Opgave at skaffe saa god Oversigt som muligt over Tændernes Variationer og til den Hensigt havt et meget stort Materiale af Slægten *Bela* til min Raadighed. Ikke alene har jeg disponeret over de rige Fund fra Expeditionen, Bergens Museum og min private Samling, men min Ven Conservator Schneider har været saa genereux at stille Tromsø Museums meget righoldige Materiale af Belaarter til min Disposition.

Inden Familien *Buccinidæ* har jeg paavist, at Tænderne er en lidet paalidelig Karakter og at de er underkastet store Variationer inden Arterne.

Hos *Pleurotomidæ* synes det ikke at være saa slemt, men Karakteren er langtfra constant og der er al Grund at være varsom med Artsdannelser, der har Piltændernes Struktur som væsentlig Grundlag. Uden at ville fastslaa det som fuldt ud constateret, skal jeg her dog nævne, at det synes som om de geografiske og de bathymetriske Forholde, eller med andre Ord de klimatiske Forholde og et paa Grund heraf forandret Levesæt har nogen Indflydelse paa Tandstrukturen. Ganske paafaldende er det, naar man tager

Pleurotomidæ.

Gen. **Bela** Leach.

In distinguishing the species included in this genus, we must, of necessity, take as the basis, Prof. G. O. Sar's work — *Mollusca regionis arcticæ Norwegiæ* — because there is no earlier work in which these closely related species are so precisely investigated, and in which such careful illustrations are given to enable their indentification to become possible.

In arriving at a determination of the species, Prof. Sars has laid a vital stress upon the structure of the arrow--teeth, and whilst I must admit that every characteristic which is constant — whether pertaining to the interior or exterior of the animal — is entitled to consideration as a specific feature, it is, yet, on the other hand, little satisfactory to the malacologist to have to do with the internal anatomical characteristics only, and we can not be satisfied with permitting a dead, but well-preserved, specimen to remain undetermined because the dental structure has not been examined. Restricted internal characteristics are not practical. We must, also, have a complete survey of the stability of the dental structure, before we can admit the title of a species where there is a deficiency in satisfactory external distinguishing features.

I have made it my study to obtain the widest possible survey over the variations of the teeth and, for this purpose, have had a very abundant material of the genus *Bela* at my disposal. Not only have I had the rich collection from the Expedition, Bergens Museum, and my private collection, but my friend Mr. Schneider, Curator of the Tromsø Museum, has been so kind as to place Tromsø Museum's very rich collection of Bela species at my disposal.

In the family of *Buccinidæ*, I have shown that the teeth are a little reliable characteristic, and that they experience great variations in the different species.

In the *Pleurotomidæ* this does not appear to be so grave, but the dental characteristic is far from constant and there is every reason to be careful in the formation of species having the structure of the arrow-teeth as their material basis. Without affirming that it is fully determined, I will, here, however, state, that it appears as if the geographical and the bathymetrical conditions or, in other words, the climatic conditions, and a consequent changed habitus, have some influence on the dental structure. It is quite remark-

Bela rugulata, Trosch. for sig at se, at den typiske brede, coniske Tandform (Tab. IX, Fig. 1) forekommer langs Kysten indtil Tromsø. I Finmarksfjordene afløses den af Formerne, afbildet i Fig. 3—4, der danner Overgangen til *B. assimilis* G. O. Sars (Fig. 9, 10). Denne sidste er ikke funden sondenfor Lofoten. Og saa kommer den rent arctiske Form *spitzbergensis* nob. (Fig. 6) med en temmelig afvigende Tandbygning. Alle disse Former hører de mindre Dyb til. Dette var den horisontale Udbredning. I de større Dyb i vore sydligere Fjorde træffe vi Formen *bergensis* nob, (Tab. IX, Fig. 8) der afviger i sin Tandstruktur fra alle de foregaaende. Af Arten *B. scalaris* Møll. har jeg ligeledes i de større Dyb fundet en Form, der har Tænder væsentlig forskjellige fra den i de høiere Vandlag (sammenlign. Tab. IX. Fig. 17 den typiske *scalaris* med Fig. 21, 22 var. *abyssicola*).

Den i Tab. IX, Fig. 1—5 afbildede Række Tænder tilhører alle *Bela rugulata forma typica*; herfra til var. *assimilis* Fig. 9—10 er kort Vei og ligesaa til *bergensis* Fig. 7—8. Formen *spitzbergensis* staar eiendommelig isoleret. Tænderne kan ogsaa variere hos det enkelte Individ, men, maa jeg tilføie, kun en Gang har jeg fundet dette i en paafaldende Grad. De 3 Tænder Tab. IX, 9, 9 *a* og 9 *b* tilhører samme Individ (*B. assimilis*) og som en lille Dværg laa Fig. 9 *a* imellem de øvrige Tænder; den var dog fuldt udviklet i Form. *Bela nobilis* Møll. og *scalaris* Møll nærmer sig ogsaa saa stærkt til *rugulata* hvad Tandstrukturen angaar, at de med denne Karakter alene neppe fortjener høierer Rang end de foran nævnte Former, men her tror jeg ligesom Sars og flere andre Forfattere, at der er ganske paalidelige ydre Karakter, der til enhver Tid vil adskille dem.

En Gruppe, som baade i ydre Former og Tandstruktur synes at gaa lige nær over i hinanden som den netop nævnte er *B. Trevelyana, decussata, Kobelti, tenuicostata* og *ovalis*. Tænderne byder her saagodtsom ingen paalidelige Skillemærker, og der forekommer ogsaa imellem flere af disse Arters Skalformer meget nære Overgange.

Efter mine Erfaringer vil Belaformerne lade sig rangere i følgende Grupper, som, hvad ydre Form og Piltændernes Struktur angaar, viser nærmest Slægtskab.

Rugulata Gruppen:

Som fælles ydre Karakter kan fremhæves: Vindingerne kjølede, de axiale Ribber rette (ikke sigmaboiede). Tænderne varierer fra bred conisk til bred lanseformig.

Arterne er: *Bela rugulata* Trosch.
„ *scalaris* Møll.
„ *nobilis* —

Cancellata Gruppen:

Skallen har de axiale Ribber sigmaboiede; Tænderne er sværdformige.

Arterne er: *Bela cancellata* Møll.
„ *cinerea* —

able that when we examine *Bela rugulata*, Trosch. we see that the typical, broad, conical dental form (Pl. IX, fig. 1) occurs along the coast as far North as Tromsø. The forms illustrated in figs. 3—4 replace it, however, in the Finmark fjords, and form the transition to *B. assimilis* G. O. Sars (figs. 9, 10). The latter is not found south of the Lofoden Isles. And now, we have the purely arctic form, *spitzbergensis* nob. (fig. 6) with a considerably divergent dental structure. All of these forms pertain to the shallow depths. This is their horizontal distribution. In the great depths of our Southern fjords, we meet with the variety *bergensis* nob. (Pl. IX, fig. 8), which, in its dental structure, varies from all the preceding ones. Of the species *B. scalaris* Møll. I have, also, in the greater depths, found a variety having teeth materially different from that of the shallow waters (compare the typical *scalaris* Pl. IX, fig. 17 with var. *abyssicola* figs. 21, 22).

The series of teeth illustrated in Pl. IX, figs. 1—5 pertains to *Bela rugulata, forma typica*; thence, to var. *assimilis*, is only a short step, and likewise, also, to *bergensis* (figs. 7, 8). The variety *spitzbergensis* stands peculiarly isolated. The teeth can, also, vary in the individual animal but, I must add that, only once have I found this to be the case in a remarkable degree. The 3 teeth, (Pl. IX, figs. 9, 9 *a* and 9 *b*) pertain to one individual (*B. assimilis*), and that shown in fig. 9 *a* lay, like a little dwarf, between the other teeth; its form was, however, fully developed. *Bela nobilis* Møll. and *scalaris* Møll. approach, also, so closely to *rugulata* in regard to dental structure, that they, from this characteristic only, scarcely merit higher rank than the previously mentioned forms but, here, I believe, in accordance with Sars and several other writers, that there are quite reliable external characteristics, sufficient, at all times, to distinguish them.

A group which appears, both in external form and dental structure, to pass as much over into one another as that just mentioned is, *B. Trevelyana, decussata, Kobelti, tenuicostata* and *ovalis*. Here, the teeth present almost no reliable distinguishing features, and there occur, also, between the shells of several of these species very close transitions.

According to my experience, the Bela species may be arranged in the following groups, which, both in regard to external form and structure of the arrow-teeth, show the closest relationship.

The *rugulata* group:

The whorls are angulated; the axial ribs straight, and not sigmoid. The teeth vary in form from broad-conical, to broad-lanceolate.

The species are: *Bela rugulata*. Trosch.
„ *scalaris* Møll.
„ *nobilis* „.

The *cancellata* group:

The shell has its axial ribs curved sigmoidally. The teeth are ensiform.

The species are: *Bela cancellata* Møll.
„ *cinerea* „

Bela obliqua G. O. Sars.
„ *Schmidti* Friele.
(*plicifera Schm.*).

Trevelyana Gruppen:

Vindingerne snart svagt kjølede, snart afrundede, har som Regel talrigere axiale Ribber end foregaaende og disse er snart rette, snart bøiede. Tænderne er sværdformige og ligne foregaaende Gruppes.

Arterne er: *Bela Trevelyana* Turt.
„ *decussata* Couth.
„ *Kobelti* Verk.
„ *tenuicostata* M. Sars.
„ *ovalis* Friele.

Af de øvrige Arter viser kun *B. bicarinata* Couth, *simplex* Midd. og *schantaricum* Midd. samt *B. impressa* Bech og *B. Sarsii* Verrill en vis Affinitet, særlig hvad Tandformerne angaar. *Bela exarata* Møll., *Koreni* n. sp., *harpularia* Couth, *pyramidalis* Strøm og *Pingeli* Møll. har derimod saa lidet Slægtskab med hinanden eller de foregaaende, at de maa staa isolerede.

Bela rugulata, Troschel.

Tab. VII Fig. 1—7, Tab IX Fig. 1—12.

Bela rugulata, (Møll.) Trosch. "Gebis d. Schnecken" Band 2, Pag. 44, Pl. IV, Fig. 6.
B rugulata, G. O. Sars, „Moll. reg. arc. Norw.", Pag 230, Tab. 23, Fig. 6.
B. assimilis, G. O. Sars, op. cit. Tab. 23, Fig. 8.
B. Gouldii, Verrill, („Cat. o. mar. Moll.") Trans. Conn. Acad. 1882, Pag 465, Pl. LVII, Fig. 6, 6*a*.

Forma typica.

Tab. VII Fig. 1 og 1 *a b*, Tab. IX, Fig. 1—5.

Mundaabningen omtrent af samme Længde som Spiret. Kjølen rundt sidste Vinding er skarp (Fig. 1*b*).

Apex (Fig. 1*a*) noget fladtrykt, første Vinding har to fremtrædende Spiralribber.

Tænderne varierer fra bred conisk til langtstrakt conisk (Tab. IX Fig. 1—5).

Forekomst: Station 224, 260, 267, 270, 273, Bodø, Tromsø og Hammerfest fra 10 til 197 Favne. Den forekommer forøvrigt langs hele den norske Kyst.

Bela obliqua G. O. Sars.
„ *Schmidti* Friele.
(*plicifera Schm.*).

The *Trevelyana* group:

The whorls, sometimes faintly angulated, sometimes rounded, have, as a rule, more numerous axial ribs than the preceding, and these are, sometimes straight, sometimes bent. The teeth are ensiform, and resemble those of the preceding group.

The species are: *Bela Trevelyana* Turt.
„ *decussata* Couth.
„ *Kobelti* Verk.
„ *tenuicostata* M. Sars.
„ *ovalis* Friele.

Of the remaining species, *B. bicarinata*, Couth; *simplex*, Midd.; and *schantaricum*, Midd.; also *B. impressa*, Bech, and *B. Sarsii*, Verrill, alone, show a certain extent of affinity, especially in regard to the dental forms. *Bela exarata*, Møll., *Koreni* n. sp., *harpularia*, Couth, *pyramidalis*, Strøm, and *Pingeli*, Møll., have, on the other hand, so little relationship to each other or to the preceding species, that they must stand isolated.

Bela rugulata. Troschel.

Pl. VII, figs. 1—7. Pl. IX, figs. 1—12.

Bela rugulata (Møll.) Trosch. „Gebiss d. Schnecken" Band 2, pag. 44, Pl. IV, fig. 6.
B. rugulata, G. O. Sars, „Moll. reg. arc. Norw." Pag. 230 Pl. 23, fig. 6.
B. assimilis, G. O. Sars, op. cit. Pl. 23, fig. 8.
B. Gouldii, Verrill, (Cat. of mar. Moll.) Trans. Conn. Acad. 1882, pag. 465, Pl. LVII, fig. 6, 6*a*.

Forma typica.

Pl. VII, fig. 1 and 1 *a*, *b*, Pl. IX, fig. 1—5.

The length of the aperture is about the same as that of the spire. The angulated part of the ultimate whorl is sharp (fig. 1*b*).

Apex (fig. 1*a*) has a somewhat flattened nucleus; the first whorl has two prominent spiral ribs.

The teeth vary, from broad-coniform to elongate-coniform (Pl. IX figs. 1—5).

Habitat: Stations, No. 224, 260, 267, 270, 273, Bodø, Tromsø and Hammerfest, in from 10 to 197 fathoms. It occurs, also, along the entire Norwegian coast.

Var clathratus, nob.

Tab. VII Fig. 2.

Rundt Vindingernes Midte gaar en fremtrædende List hvorved en stormasket gitret Sculptur fremkommer.

Forekomst: Station 270—136 Favne.

Operculum (Fig 2 *b*) er typisk lang oval.

Var spitzbergensis, nob.

Tab. VII Fig. 3, 3 *a*, 4 og Tab. IX Fig. 6, 6 *a*.

Formen og Forholdet imellem Spir og Mundaabning er typisk. I Skulpturen afviger nærværende Varietet ved en stærkere fremtrædende Kjøl, der kan gaa over til en skarp fremstaaende Kant (Fig. 4) og en noget kraftigere Spiralstriering.

Operculum Fig. 3 *a* synes at være noget bredere end det typiske.

Størrelse. Axiallængde 19mm Diameter 10mm.

Tænderne (Pl. IX Fig. 6, 6 *a*) har en eiendommelig Indskjæring paa den ene Side; Formen forøvrigt er den brede typiske. Af 6 undersøgte Exempl. viste alle uforandret den samme Struktur.

Forekomst: Magdalenebay (Spitzbergen) 40 til 50 Favne.

Dr. A. Krause, som forleden Sommer besøgte mig, har fundet denne Form i Beringshavet og hans Tegninger af Tænderne stemme aldeles overens med mine. Han var tilbøielig at holde den for en god Art væsentlig paa Grund af dens udprægede Tandstructur.[1]

Var bergensis, nob.

Tab. VII Fig. 5 *a* b *c*, 6, Tab. IX Fig. 7, 8.

Spiret noget længere end Mundaabningen; axiale Ribber talrigere end hos den typiske.

Apex (Fig. 5 *a b*) afrundet, første Vinding har 3—4 Spiralribber.

Operculum (Fig. 5 *c*) er ikke væsentlig afvigende fra det typiske.

Tænderne (Tab. IX Fig. 7. 8) har jeg hyppigst fundet som afbildet i Fig. 8 med det dybe Indsnit i Siden, men den derfra væsentlig afvigende Form i Fig. 7 er imellem forekommen.

Forekomst: Under Expeditionen fandtes den ved Sognefjordens Munding. Forøvrigt har jeg oftere fundet den ved Bergen paa omkring 100 Favne, og Dr. Danielssen har den fra Molde. Nordenfor dette Sted har jeg ikke observeret den. Min afdøde Ven. Dr. Jeffreys holdt den for en god Art.

[1] Efterat nærværende Arbeide var færdig skrevet, har Dr. Arth. Krause været saa venlig at sende mig et Separataftryk af: „*Ein Beitrag zur Kenntniss d. Moll. Fauna Beringsmeeres*", og jeg ser deraf, at han har bibeholdt det af mig givne Navn for Formen.

Var. clathratus, nob.

Pl. VII fig. 2.

Round the middle of the whorls, a projecting fillet occurs, producing a coarsely cancellated sculpture.

Habitat: Station No. 270. Depth 136 Fathoms.

The *operculum* (Fig. 2 *b*) is typically elongato-ovate.

Var. spitzbergensis, nob.

Pl. VII figs. 3, 3*a*, 4 and Pl. IX figs. 6, 6*a*.

Shell, and the relations between the spire and the aperture, are typical. This variety differs, in its sculpture, in having a more projectant angle, which may occasionally pass into a sharp protuberant edge (fig. 4), and in a somewhat more marked spiral striation.

The *operculum* (fig. 3*a*) appears to be somewhat broader than the typical one.

Size. The axial length 19mm; the diameter 10mm.

The teeth (Pl IX fig. 6, 6 *a*) have a peculiar recessment upon the one side; the form, otherwise, is the broad typical one. Out of 6 specimens examined, all showed the same uniform structure.

Habitat: Magdalene Bay (Spitzbergen). Depth, 40—50 fathoms.

Dr. A. Krause, who visited me last summer, has found this form in Behring's sea; and his illustrations of the teeth accord completely with mine. He was inclined to regard it as a separate species, principally, on account of its distinct dental structure.[1]

Var. bergensis, nob.

Pl. VII fig. 5 *a b c*, 6, Pl. IX fig. 7, 8.

The spire is somewhat longer than the aperture, and the axial ribs are more numerous than in the typical form.

Apex (fig. 5 *a b*) obtusely rounded. The first whorl has 3—4 spiral ribs.

The *operculum* (fig. 5 *c*) is not materially different from the typical one.

The *teeth* (Pl. IX fig. 7, 8), which I have most frequently found, are like those illustrated in fig. 8, with the deep recessment in the side, but the structure differing materially from it, shown in fig. 7, occasionally appears.

Habitat: It was found by the Expedition at the mouth of the Sognefjørd. I have, otherwise, frequently found it near Bergen, in about 100 fathoms, and Dr. Danielssen has found it at Molde. To the North of that place I have not observed it. My lamented friend Dr. Jeffreys regarded it as a distinct species.

[1] Since the present work was written, Dr. Arth. Krause has been so kind as to send me a copy of „*Ein Beitrag zur Kenntniss d. Moll. Fauna Beringsmeeres*", and I see, from it, that he has retained the appelation which I have given to the form.

Var **assimilis**, Sars.

Tab. IX Fig. 9 *a*, *b*, 10 (Tænderne).

Bela assimilis, G. O. Sars, Moll. reg. arc. Norw., Pag. 231, Tab. 23, Fig. 8.

Jeg har flere Gange fundet frem Tandformer i Exemplarer fra Tromsø lignende dem af Prof. Sars for *B. assimilis* fremstillede, men i ydre Form kan jeg ikke finde nogen Afvigelse fra den typiske. Hos et Exemplar fandt jeg den Eiendommelighed, at der imellem de forøvrigt fuldt udviklede Tænder forekom en enkel en af kun halve Størrelse mod de øvrige, men forresten regelmæssig i Form (Fig. 9 *a* og 9 *b*. alle 3 fra samme Individ).

Var **scalaroides**, Sars.

Tab. VII Fig. 7 *a*, *b*, Tab. IX Fig. 11, 12.

Bela scalaroides, G. O. Sars, Moll. reg arc. Norw., Pag. 231, Tab. 23, Fig. 7.

Formen langstrakt; Spiret længere end Mundaabningen.

Apex (Fig. 7 *a*) ligesom *Operculum* (Fig. 7 *b*) ligner de typiske.

Tænderne (Tab. IX, Fig. 11, 12) har den brede typiske Form.

Forekomst: St. 261, 290 fra 127—191 Favne.

Kun 2 Explr. blev fundne. Efter de faa Individer, som endnu er kjendte af denne Form, vil det efter min Mening være forhastet at erkjende dens Berettigelse som Art og Tandstrukturen viser paa det tydeligste dens Familieskab med *B. rugulata*. Skallens Sculptur afviger heller ikke fra denne, men derimod er Skallens langstrakte Form hos *scalaroides* iøienfaldende.

Bela nobilis, Møll.

Tab. VII, Fig. 8 *a*, *b*, Tab. IX, Fig. 13—15.

Defrancia nobilis, Møller, Krøyers Tidsskrift („Ind. Moll. Groenl.“) 1842—43, Pag. 85.

Bela nobilis, G. O. Sars, Moll. reg. arc. Norw., Pag. 228, Tab. 16, Fig. 19—20.

Formen som hos *B. rugulata*; Spiret er i Regelen kortere end Mundaabningen; axiale Ribber stærkt fremtrædende og imellem disse er rundt den kjølede Del af sidst Vinding en dybere Indskjæring og i denne Fordybning viser den transverse Sculptur sig tydelig (Fig. 8 *a*).

Operculum (Fig 8 *b*) ligner *B. rugulata*.

Var. **assimilis**, Sars.

Pl. IX figs. 9 *a*, *b*, 10 (The teeth).

Bela assimilis, G. O. Sars, Moll. reg. arc. Norw., pag. 231, Pl. 23, fig. 8.

I have frequently discovered, in specimens from Tromsø, dental forms resembling those given by Prof. Sars for *B. assimilis*; but externally I can find no divergence from the typical form. In one specimen, I noticed the peculiarity that, between the otherwise fully developed teeth, there occurred a single one of only half the size of the others, but regular in form otherwise, (figs. 9 *a* and 9 *b* all the 3 from the same individual).

Var. **scalaroides**, Sars.

Pl. VII fig. 7 *a*, *b*, Pl. IX fig. 11, 12.

Bela scalaroides, G. O. Sars, Moll. reg. arc. Norw. pag. 231, Pl. 23, fig. 7.

Shell elongate; the spire longer than the aperture.

Apex (fig. 7 *a*) resembles the typical one, and the same is the case with the *operculum* (fig. 7 *b*).

The teeth (Pl. IX, figs. 11, 12) have the broad typical form.

Habitat: Stations No. 261, 290. Depth 127—191 fathoms.

Only two specimens were found. From the few specimens of this form which have as yet been found, it is, in my opinion, premature to acknowledge its title to be a distinct species. The dental structure shows, distinctly, its family relationship to *B. rugulata*; and neither can I in the sculpture of the shell find divergencies, but, on the other hand, the elongate form of the shell in *scalaroides* is conspicuous.

Bela nobilis, Møll.

Pl. VII fig. 8 *a*, *b*, Pl. IX fig. 13—15.

Defrancia nobilis, Møller, Krøyers Tidsskrift („Ind. Moll. Groenl.“) 1842—43, pag. 85.

Bela nobilis, G. O. Sars, Moll. reg. arc. Norw., pag. 228, Pl. 16, figs. 19, 20.

Shell resembles that of *B. rugulata*; the spire, as a rule, is shorter than the aperture; the axial ribs strongly projectant, and between them, round the angulated ultimate part of the whorl, a deepish concavity occurs, in which the transversal sculpture distinctly appears (fig. 8 *a*).

The *operculum* (fig. 8 *b*) resembles that of *B. rugulata*.

Tænderne (Tab. IX, Fig. 13, 14 og 15) er smalere end foregaaende Formers, men varierer.

Forekomst: Tromsø og Hammerfest. Udenfor Kysten blev den ikke funden. Den angives af Prof. Leche[1] fra Novaja Semblja og Kariske Havet.[2]

Bela scalaris, Møll.

Tab. VII, Fig. 9—14, Tab. IX, Fig. 16—22.

Defrancia scalaris, Møll. Krøyers Tidsskrift 1842, Pag 85.
Bela scalaris, G. O. Sars, op. c., Pag. 229, Tab. 16, Fig. 6, og Tab. 23, Fig. 5.
Bela scalaris, Verrill, Catal of Marine Moll. 1882, Pag. 471.

Formen langstrakt, Spiret længere end Mundaabningen, Spiralstieringen tættere og mere regelmæssig end hos *B. rugulata*.

Apex (Fig. 14 *a*, *b*) afrundet tilspidset; paa første Vinding er kun svage (2—3) Spiralribber synlige.

Operculum afviger hos almindelig store Exemplarer ikke fra foregaaende Arters. Det i Fig. 10 a afbildede tilhører det store Exemplar Fig. 10 og holder jeg denne Operculumform for at være anomal.

Fig. 10 er Sars's *forma typica* og
" 9 hans var. *ecarinata*.

Var **abyssicola**, nob.

Tab. VII, Fig. 12—13, Tab. IX, Fig. 21—22.

Store Exemplarer har en finere Spiralsculptur end Typeformen og en kortere Cauda, men unge afviger ikke noget væsentlig. De axiale Ribbers Antal er stærkt vexlende.

Tænderne hos *forma typica* og *var. ecarinata* (Tab. IX, Fig. 16—20) kommer nærmest *B. rugulata var. assimilis*, hvorimod de hos *var. abyssicola* (Tab. IX, Fig. 21—22) ligner noget *B. rugulata var. spitzbergensis*.

Forekomst: *forma typica*: St. 18, 79, 260, 261, 290, 323, 357 fra 123 til 223 Favne.

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[1] Svenska Vetenskb. Akad. Handl. B 16 „Oversigt over N. Semblja og Jenisei Hafsmollusker."

[2] Herzenstein „Beitr. Fauna Murman Küste und des Weiss Meeres" har angivet den fra Murmanske Kyst. Jeg beklager, at Dr. Herzensteins Arbeide, der for mig og alle, der behandler de arctiske Mollusker vilde være af største Interesse, ikke er skrevet paa et af de europæiske Kultursprog.

Dr. Krause (op. c.) angiver den fra Beringshavet.

The *teeth* (Pl. IX, figs. 13, 14 and 15) are more slender than in the preceding forms, but vary.

Habitat: Tromsø and Hammerfest. It was not found away from the coast. It is stated by Prof. Leche[1] to pertain to Nova Zembla and the Kara Sea.[2]

Bela scalaris, Møll.

Pl. VII, figs. 9—14, Pl. IX, figs. 16—22.

Defrancia scalaris, Møll. Krøyers Tidsskrift 1842, pag. 85.
Bela scalaris, G. O. Sars, op. c., pag. 229, Pl. 16, fig. 6 and Pl. 23, fig. 5.
Bela scalaris, Verrill, Catal. of Marine Moll. 1882, pag. 471.

Shell elongate; the spire longer than the aperture; the spiral striation closer, and more uniform than in *B. rugulata*.

Apex (fig. 14 *a*, *b*) rounded acuminate; on the first whorl, only faint spiral ribs (2—3) are visible.

The *operculum*, in specimens of ordinary size, does not differ from that of the preceding species. That illustrated in fig. 10 *a* pertains to the very large specimen illustrated in fig. 10, and I consider this operculum to be anomalous.

Fig. 10, is Sar's *forma typica*, and
" 9, is Sar's var. *ecarinata*.

Var. **abyssicola**, nob.

Pl. VII, fig. 12—13, Pl. IX, fig. 21—22.

Large specimens have a finer spiral sculpture than the typical form, and a shorter cauda, but young ones do not materially differ from it. The number of axial ribs is greatly variable.

The *teeth* in *forma typica* and *var. ecarinata* (Pl. IX, fig. 16—20) approach most to those of *B. rugulata var. assimilis*, whilst in *var. abyssicola* (Pl. IX, fig. 21—22) they somewhat resemble those of *B. rugulata var. bergensis*.

Habitat: *forma typica*: Stats. No. 18, 79, 260, 261, 290, 323, 357 in from 123 to 223 fathoms.

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[1] Svenska Vetenskb. Akad. Handl B 16 „Oversigt over N. Semblja og Jenesei Hafsmollusker."

[2] Herzenstein („Beitr. Fauna Murman Küste und des Weiss Meeres") has stated it as pertaining to the Murman coast. I regret that Dr. Herzensteins work, which would be for me, and all who treat of the arctic mollusca, of the greatest interest, is not written in one of the European popular languages.

Dr. Krause (op. c.) states it as pertaining to Behrings Sea.

Var *abyssicola*: St. 124, 192, 200, 251, 312, fra 350 til 658 Favne.

Den er af Møller fundet ved Grønland, af Verrill[1] ved New-Englands Kyster og af Leche[2] fra Kariske Havet.[3]

Efter Tandstrukturen burde Varieteten *abyssicola* være anført under *B. rugulata*, men uden Anledning til at undersøge denne Karakter, vilde man absolut være henvist til at bestemme Formen for *B. scalaris*. Dette viser kun, hvor overordentlig nært Familieskab, der er imellem alle de forannævnte Former.

Dr. Jeffreys[4] slaar alle disse sammen med *B. turricula* Mont. og Prof. Leche[5] slutter sig hertil, gaar kun et Skridt videre og føier *B. exarata*, Møll. til. At Montagues Art er noget ganske forskjelligt fra de her i Spørgsmaal værende Former har baade Troschel[6] og Sars[7] paavist, og ligesaalidt kan med Rimelighed *B. exarata* sammenblandes med disse, men at slaa Resten sammen under Hovedformen *B. rugulata* har jeg ikke saa liden Sympathi for. Naar jeg ikke har fulgt denne Fremgangsmaade, saa er det for en Del for at skaffe Lys over et Par mere udprægede Formers geografiske Udbredelse.

Var *abyssicola*: Stats. No. 124, 192, 200, 251, 312 in from 350 to 658 fathoms.

It has also been found, by Møller, off Greenland; by Verrill[1], off the coast of New England; and by Leche[2], in the Kara Sea.[3]

According to the dental structure, the variety *abyssicola* ought to be classed under *B. rugulata*, but without having an opportunity of examining the dental character, we would necessarily be obliged to determine the form as *B. scalaris*. This just shows what an extremely close family relationship exists between all of the before-named forms.

Dr. Jeffreys[4] includes them all, along with *B. turricula* Mont. and Prof. Leche[5] concurs in this, but proceeds a step further, and adds *B. exarata*, Moll. Both Troschel[6] and Sars[7] have shown, that Montague's species is something perfectly different from the forms in question here, and just as little can *B. exarata* be, reasonably, mixed up with them; but to include the rest under the parent form *B. rugulata*, is a proceeding against which I have little objection to urge. That I have not adopted this course arises, in a measure, from a desire to elucidate the geographical distribution of a couple of more distinctly marked forms.

Bela obliqua, G. O. Sars.

Tab. VII, Fig. 15, 16, 17, Tab. X, Fig. 1, 2.

B. obliqua, Sars, op. c. Pag. 226, Tab. 16, Fig. 6.

Dette er en utvivlsom god Art, der ved sin cylindriske Form, sin korte, aabne Canal og sine sigmabøiede axiale Ribber er let kjendelig.

Apex (Fig. 15 *a* b) er som sædvanlig hos alle Belaarter vanskelig at finde i ubeskadiget Stand og af en hel Mængde Exemplarer har jeg kun fundet 2 unge Individer med hel Apex. Paa det ene var Embryonaltoppen fladtrykt, glat og paa det andet mere hævet; første Vinding har 2 til 3 stærke Spiralribber.

Operculum (Fig. 15 *c*) er langt, ovalt.

Tænderne (Pl. X, Fig. 1—2) er, som hos alle i denne Gruppe, langstrakte, sværdlignende med en noget langt Manubrium, og de talrige Exemplarer, jeg har undersøgt, har ikke i nogen paafaldende Grad varieret.

Forekomst: Salten, Tromsø, Hammerfest 10 til 20 Favne. Den er endnu ikke funden søndenfor Bodø og hellere ikke er den funden udenfor den norske Kyst.

Bela obliqua, G. O. Sars.

Pl. VII, figs. 15, 16, 17, Pl. X, figs. 1, 2.

B. obliqua. Sars, op. c. Pag. 226, Pl. 16, fig. 6.

This is an indubitably distinct species which is easily distinguished by its cylindrical form, its short open canal, and its sigmoidal axial ribs.

Apex (fig. 15 *a*, *b*), as is usually the case in all the Bela species, is difficult to obtain in an undamaged condition, and, out of a large number of specimens, I have only found two young ones with entire apex. In the one the nucleus was flattened and smooth, whilst in the other it was more elevated; the first whorl has 2 to 3 strong spiral-ribs.

The *operculum* (fig. 15 *c*) is ovo-elongate.

The *teeth* (Pl. X, fig. 1—2) are, like all pertaining to this group, elongate, and ensiform, with a somewhat long manubrium; and the numerous specimens which I have examined have not, in any remarkable way, differed.

Habitat: Salten, Tromsø, Hammerfest. Depth 10 to 20 fathoms. It has not, yet, been found South of Bodø, and neither has it been found away from the Norwegian coast.

[1] Verrill „Catalog of marine Moll." 1882, Pag. 471.
[2] Leche, Vetenskb. Acad. Handl. „Hafsmollusker", Pag. 52.
[3] Angives fra Murman Kysten af Herzenstein.
[4] Ann. & Mag. 1876 „Valorous Exp." Pag. 332.
[5] Leche op. c. Pag. 52.
[6] Gebiss d. Schnechen B 2. Pag. 44, Tab. IV.
[7] Sars, „Moll. reg. arc. Norw."

[1] Verrill. Catalogue of Marine Moll. 1882, pag. 471.
[2] Leche, Vetenskb. Akad. Handl. „Hafsmollusker", pag. 52.
[3] Herzenstein also states that it pertains to the Murman coast.
[4] Ann. & Mag. 1876 „Valorous Exp." pag. 332.
[5] Leche op. c., pag. 52.
[6] Gebiss d. Schnecken B. 2, pag. 44, Pl. IV.
[7] Sars „Moll. reg. arc. Norw."

Den eneste Art, som denne skulde kunne forvexles med, maatte være unge Exemplarer af *Bela cancellata.* De har nemlig tilfælles de sigmabøiede axiale Ribber og at Partiet mellem Suturen og Kjølen er fri for Spiralsculptur, men den cylindriske Form og aabne Canal hos ***B. obliqua*** vil altid adskille dem.

Bela cancellata, Migh.

Tab. VII, Fig. 18—22, Tab. X, Fig 3—5.

Fusus cancellatus, Migh. Pro. Bost. Soc. Nat. Hist. I (1840), Pag. 50.
Defrancia elegans, Møll. Krøyers Tidskr. 1842. (Ind. Moll. Groenl.), Pag. 86.
Bela elegans, G. O. Sars, op. c. Pag. 225, Pl. 16, Fig. 15.
B. cancellata, Verrill, Cat. of marine Moll. 1882, Pag. 475, Pl. XLIII, Fig. 10, 11.
Tritonia declivis, Lovén, Oversigt Vet. Acad. Forh. 1846, Pag. 145.
Bela declivis, G. O. Sars, op. c. Pag. 224, Tab. 16, Fig. 10.

Forma typica.

Tab. 7, Fig. 18—19.

Formen clathrat fusiform, de øverste Vindinger kjølede; de axiale Ribber sigmabøiede og Partiet imellem Suturen og Kjølen er paa Hovedvindingen uden eller med meget svag Spiralsculptur.

Apex er undertiden tilspidset (Fig. 18 *a*), men gaar ofte over til afrundet (Fig. 20 *a, b*).

Tænderne (Tab. X, Fig. 3—5) langtstrakte, sværdformige med et noget kort Manubrium. Fig. 5 tilhører et meget stort Exemplar af var. *declivis,* Lov., men forøvrigt afviger ikke denne Varietet i sin Tandbygning fra Typeformen.

Forekomst: St. 101, 200, 261, 262, 267, 290, 312 og 359 fra 127 til 658 Favne.

Var **declivis**, Lov.

Tab. VII, Fig. 20—22.

Formen mere langstrakt og Vindingerne uden Kjøl.

Forekomst: St. 164, 192, 200, 323, Tromsø og Hammerfest fra 20 til 650 Favne.

Denne Varietets sydligste Forekomst er Molde, hvorfra Dr. Danielssen har den.[1]

[1] Herzenstein (op. c.) angiver den fra Murmankysten.

The only species with which this one might possibly be confused, would be young specimens of *Bela cancellata.* They have, for instance, these features in common; the sigmoidal axial ribs, and also, that the part between the suture and the ridge is devoid of spiral sculpture; but the cylindrical form and open canal of *B. obliqua* will always serve to distinguish them.

Bela cancellata, Migh.

Pl. VII, fig. 18—22, Pl. X figs. 3—5.

Fusus cancellatus, Migh. Pro. Bost. Soc. Nat. Hist. I (1840), Pag. 50.
Defrancia elegans, Møll. Krøyers Tidskr. 1842. (Ind. Moll. Groenl.), pag. 86.
Bela elegans, G. O. Sars, op. c. pag. 225, Pl. 16, fig. 15.
B. cancellata, Verrill, Cat. of Marine Moll. 1882, pag. 475, Pl. XLIII, fig. 10, 11.
Tritonia declivis, Lovén, Oversigt Vet. Akad. Forh. 1846, pag. 145.
Bela declivis, G. O. Sars, op. c. pag. 224, Pl. 16, fig. 10.

Forma typica.

Pl. VII, fig. 18—19.

Shell clathri-fusiform; the primary whorls angulated, the axial ribs sigmoidal, and the part between the suture and the ridge is, in the Body-whorl, devoid of, or only has a very faint, spiral sculpture.

The *Apex* is sometimes acuminated (fig. 18 *a*) but often assumes a rounded form (fig. 20 *a*, b).

The *teeth* (Pl. X, figs. 3—5) elongate, and ensiform, with a somewhat short manubrium. Fig. 5 pertains to a very large specimen of var. *declivis* Lov. but this variety does not, otherwise, differ in its dental structure from the typical form.

Habitat: Stat. No. 101, 200, 261, 262, 267, 290, 312 and 359, in from 127 to 658 fathoms.

Var. **declivis**, Lov.

Pl. VII, fig. 20—22.

Shell more elongate, and the whorls are rounded.

Habitat: Stat. No. 164, 192, 200, 323, Tromsø, and Hammerfest, in from 20 to 650 fathoms.

The most Southerly occurrence of this variety is at Molde, at which place it has been found by Dr. Danielssen.[1]

[1] Herzenstein (op. c.) states that it pertains to the Murman coast.

Jeg har længe staaet usikker om begge de her nævnte Former burde have Ret at opføres som selvstændige Arter, men efterat min Ven Conservator Schneider forrige Aar havde sendt mig ny stor Suite med talrige Exemplarer i alle Størrelser, er jeg ikke længere i Tvivl om, at *declivis* kun er en Varietet af *cancellata*. I Ungdomsstadiet ligner begge hinanden fuldkommen og det vil være umuligt at udpege, hvad der vil udvikle sig til *declivis* eller til *cancellata*. Selv imellem voxne Explr. er der alle Overgange. Dog har jeg aldrig seet saa store Explr. af *B. cancellata* som af *declivis*, og jeg har derfor en Mistanke om, at alle *cancellata*, naar de faa Levetid, vil udvikle sig til Formen *declivis*.

Prof. Verrill og flere andre Venner har havt den Godhed at sende mig Exemplarer af *B. cancellata* fra Amerika og jeg kan ingen anden Forskjel se imellem Formen paa denne Side Atlanterhavet den og paa hin Side, end at Skallen hos os er som Regel hvid (enkeltvis har jeg truffet den med et svagt Rosenskjær) og der rødagtig til brun.

Ifølge Verrill[1] skal den ogsaa paa den amerikanske Side kunne .forekomme hvid og lysrød (pale rosy). Den er kanske ogsaa noget mere solid. Men den Smule Farveafvigelse kan ikke berettige en Artsadskillelse og ligesaa lidt en svagere eller stærkere Skaldannelse.

Bela vitrea, Verrill[2] synes, efter et Typeexempl., som Prof. Verrill har havt den Venlighed at sende mig, ikke at adskille sig fra *B. cancellata* uden ved mere afrundede Vindinger.

Dr. Jeffreys[3] opretholdt *B. elegans*, Møll. og *declivis*, Lov. som gode Arter og Prof. G. O. Sars[4] har fulgt ham i dette Stykke, men med „nogen Tvivl.“ Med et lidet Material for sig er det ikke saa let at faa Overblik over en Arts Variationsomraade.

Bela cinerea, Møll.

Tab. VII, fig. 23 *a*, Tab. X, Fig. 6.

Defrancia cinerea, Møller, Krøyers Tidskr. 1842, Pag. 86.
Bela cinerea, G. O. Sars, op. c. Pag. 227, Tab. 23, Fig. 4.

Formen lig *B. cancellata, forma typica*, kun Hovedvindingen større, Vindingerne afrundede; de axiale Ribber er talrigere end hos foregaaende Art og Spirallinierne er furedannede.

En vel bevaret Apex er det ikke lykkes mig at finde.

[1] Verrill „Catal. of mar. Moll.“ 1882, Pag. 476.
[2] V. „Moll. of the New England Coast“ 1884, Pag. 160.
[3] Ann. og Mag. 1876 (Valorous Expl.) Pag. 331.
[4] Moll. reg. arc., Pag. 226.

I have long been in a state of uncertainty whether the two forms named, here, are entitled to be established as independent species; but subsequent to the reception of a new, large and numerous suite of specimens of all sizes, sent me, last year, by my friend Mr. Schneider, I have no longer any doubt that *declivis* is simply a variety of *cancellata*. In the juvenile stage they resemble each other, completely, and it would be impossible to point out what will develope into *declivis*, or what into *cancellata*. Even in adult specimens there is every form of transition. I have however never seen such large specimens of *B. cancellata* as of *declivis*, and I have, therefore, a suspicion that all the *cancellata* develope into the form *declivis* when their life is sufficiently prolonged.

Prof. Verrill and several other friends have had the kindness to send me specimens of *B. cancellata* from America, and I can discover no other variation between the form from that side of the Atlantic Ocean and that from this side of it, than that the shell in ours is, as a rule, white (occasionally I have met with it having a faint rose tinge) whilst in theirs it is reddish to brown.

According to Verrill[1] it may also be met with on the American side, white and pale rosy. It is, also, perhaps, somewhat more solid. The trifle of variation in colour does not warrant a separation of species, and just as little does a thinner, or thicker, shell.

Bela vitrea, Verrill[2] appears, from a typical specimen which Prof. Verrill has had the kindness to send me, not to differ from *B. cancellata* except in its having more rounded whorls.

Dr. Jeffreys[3] affirmed *B. elegans*, Møll. and *declivis*, Lov. to be distinct species, and Prof. G. O. Sars[4] has followed him in this, but „with dubiety.“ With a small material at disposal, it is not easy to obtain a survey over the complete field of the variations of a species.

Bela cinerea, Møll.

Pl. VII, fig. 23 *a*, Pl. X, fig. 6.

Defrancia cinerea, Møller, Krøyer's Tidskrift 1842, pag. 86.
Bela cinerea, G. O. Sars, op. c. pag. 227, Pl. XXIII, fig. 4.

The shell resembles that of *B. cancellata, forma typica*, except that the Body whorl is larger and the whorls rounded; the axial ribs more numerous than in the preceding species, and the spiral striations are imprinted.

I have not been fortunate enough to meet with a well preserved apex.

[1] Verrill „Catal. of Marine Moll.“ 1882, pag. 476.
[2] Verrill „Moll. of the New England Coast“ 1884, pag. 160.
[3] Ann. and Mag. 1876 („Valorous Exp.“) pag. 331.
[4] „Moll. reg. arc. Norv., pag. 226.

Operculum Fig. 23 *a*.

Tænderne (Tab. X, Fig. 6, 6 *a*) afviger ikke fra foregaaende Arts.

Forekomst: St. 262, 273, 337, 359, 363 fra 146 til 416 Favne.

Uagtet denne Form staar meget nær *B. cancellata*, saa vil den dog i alle Aldersstadier kunne lade sig udskille.

Bela Schmidti, nob.

Tab. VIII, Fig. 6.

Mangelia? plicifera, Schmidt (non S. Wood), Mem. l'acad. de sciences (Result. d. Mamuthexped.) St. Petersb. 1872, Pag. 57, Tab. IV, Fig. 4. 5.

Pleurotoma plicifera, Leche, Overs. Vet. Akadm. Handl. („Novaja Semblja og Jenisey Hafsmollusker") Pag. 58.

Kun et voxent Exemplar med en noget mutileret Læbe blev fundet i Magdalenebay (Spitzbergen) 30 Favne og et ganske lidet i Adventbay 20 Favne.

Schmidts Tegning af *Mangelia plicifera* ligner saa lidet Woods *Clavatula plicifera*[1], at jeg neppe kan tro, at dette er den engelske Cragform. Jeg vover derfor at foreslaa Navnet *Schmidti* for den recente arktiske Art. Den har nogen Lighed i Form med *B. cancellata*, men Sculpturen er væsentlig forskjellig.

Axialribberne er sigmadannede og meget stærkt fremtrædende; Spiralsculpturen tæt og meget fin, kun paa Hovedvindingens nederste Del er mere skarpt indskaarne Linier. Vindingerne er afrundede. Farven er rødlig.

Det unge Exemplar fra Adventbay, som med sine udprægede stærke Axialribber henviser den til denne Art, har kjølede Vindinger.

Dr. Schmidts Tegninger stemmer godt overens med mit Exemplar og Prof. Leche har havt den Velvillie at sende mig hans *Pl. plicifera* fra det Kariske Hav og jeg har saaledes overbevist mig om, at min Bestemmelse er overensstemmende med Leches. Hr. Arth. Krause har meddelt mig at han har Arten fra Beringshavet.[2]

[1] Wood „Moll. from the Crag" Vol. 1, Pag. 64, Pl. VII. Fig. 15.

[2] I Krauses „Beitrag zur Kentnisz Moll. Fauna Beringsmeeres" Tab. XVIII, Fig. 1 er en fuldstændigere Tegning af *Bela Schmidti* end min og i hans Fig. 7 er Tandformen fremstillet. Hr. Krause gjør opmærksom paa, at Tænderne er paafaldende store, nemlig 1 mm. lang. Han gjør ligeledes opmærksom paa at *Bela turpa*, Dall sandsynligvis er denne Art og jeg skal indrømme, at Dalls Beskrivelse (Pro. U. S. Nat. Museum 1885, Pag. 523) passer vel, men uden Tegning kan man vanskeligt med Sikkerhed identificere Arten.

Operculum, fig. 23 *a*.

The *teeth* (Pl. X, fig. 6, 6 *a*) do not differ from those of the preceding species.

Habitat: Stats. Nos. 262, 273, 337, 359, 363 in from 146 to 416 fathoms.

Although this form stands closely related to *B. cancellata*, it is, however, distinguishable in all stages of its growth.

Bela Schmidti, nob.

Pl. VIII, fig. 6.

Mangelia? plicifera, Schmidt (non S. Wood), Mem. l'acad. de sciences. (Result. d. Mamuthexped.) St. Petersb. 1872, pag. 57, Pl. IV, figs. 4, 5.

Pleurotoma plicifera, Leche, Overs. Vet. Akad. Handl. (Novaja Semblja and Jenesey Hafsmollusker) pag. 58.

Only one adult specimen with a somewhat mutilated lip was found at Magdalene Bay (Spitzbergen) in 30 fathoms; and quite a small one, at Advent Bay, in 20 fathoms.

Schmidt's illustration of *Mangelia plicifera* so little resembles Woods *Clavatula plicifera*[1], that I can scarcely believe it to be the English crag-form. I venture therefore to propose the appellation *Schmidti* for this recent arctic species. Its form has some resemblance to that of *B. cancellata*, but the sculpture is materially different.

The axial ribs are sigmoidal, and very strongly prominent. The spiral structure very fine and close, and it is only in the lower part of the Body whorl that the striations appear more strongly imprinted. The whorls are rounded. The colour is reddish.

The young specimen from Advent Bay; which from its distinct strong axial ribs plainly refers itself to this species; has angulated whorls.

Dr. Schmidt's illustrations coincide, well, with my specimen, and Prof. Leche has had the kindness to send me his *B. plicifera* from the Kara Sea; I have, thus, convinced myself that my determination is in accord with Leches. Dr. Arth. Krause has informed me that he has the species from Behrings Sea.[2]

[1] Wood „Moll. from the Crag" Vol. 1. pag. 64. Pl. VII, fig. 15.

[2] In Krauses „Beitrag zur Kentniss Moll. Fauna Beringsmeeres" Pl. XVIII, fig. 1 there is a more complete illustration of *Bela Schmidti* than mine; and in his fig. 7 the dental form is given. Dr. Krause calls attention to the fact that the teeth are remarkably large, namely 1 mm. in length. He further remarks that *Bela turpa*, Dall, is probably this species, and I must admit that Dalls description (Pro. U. S. Nat. Mus. 1885, pag. 523) accords well, but without an illustration it is difficult to identify the species with certainty.

Bela Trevelyana, Turt.

Tab. VIII, Fig. 7—10, Tab. X, Fig. 10—11.

Pleurotoma Trevellianum, Turton, Ann. & Mag. of Nat. Hist. VII, Pag. 351.
Mangelia Trevelliana, Forb. & Hanl. Brit. Moll. Vol. III, Pag. 452, Pl. CXII, Fig. 1—2.
Pleurotoma Trevelyana, Jeffreys, Br. Conch. Vol. IV, Pag. 398.
Bela Trevelyana, G. O. Sars, op. c. Pag. 235, Tab. 16, Fig. 13.

Denne Art er i høi Grad varierende i Form og ligesom den i den arctiske Zone opnaar sin betydeligste Størrelse, har den ogsaa her sin største Afveksling. Som Regel er Spiret lige langt eller længere end Mundaabningen. Vindingerne kjølede, de axiale Ribber talrige, ikke meget fremstaaende og rette, Spirallinierne talrige, men uregelmæssige i Styrke.

Apex (Fig. 9 *b, c*) afrundet nedtrykt og paa første Vinding kommer en 2 ribbet Spiralsculptur tilsyne; Axialsculpturen meget svag.

Operculum Fig. 9 *a*.

Den typiske arctiske Form er afbildet i Fig. 7 og 8.

Fig. 9 er en eiendommelig kortspiret Form fra Tromsø, hvor den ikke er sjelden og

Fig. 10 er en ualmindelig faaribbet Form fra samme Sted.

Tænderne (Tab. X, Fig. 10—11) er dolkeformede med et temmelig kort Manubrium.

Forekomst: St. 223, 224, 261, 267, 270, 273, 326, 357, Bodø, Tromsø og Hammerfest fra 10—197 Favne.

Omend jeg fastholder *B. Trevelyana* og efterfølgende *B. decussata* for distincte Arter, saa er der dog et meget nært Slægtskab imellem dem og der forekommer Former, som man vil have Vanskelighed for med Sikkerhed at anvise Plads.

Under *B. decussata* har jeg optaget en Varietet *finmarchia*. Denne var jeg usikker, hvor den burde anbringes, men jeg tror den er kommen paa rette Sted, og en Bekræftelse herpaa har jeg faaet i Exemplarer, præcis af denne Form, sendt mig fra Prof. Verrill under Bestemmelsen *B. decussata*, Couth.

Der er et Par Karakterer, som synes constant at adskille *B. Trevelyana* fra *decussata*. Apex er hos den første temmelig fladtrykt, hvorimod den hos den sidste er mammilleformet. Dernæst er de axiale Ribber hos *Trevelyana* rette og mindre fremtrædende end hos *decussata*, hvor de, foruden at være mere hævede, altid er mere eller mindre bøiede, dog i denne sidste Karakter gaa de over i hinanden. Og saa kommer endelig *Tænderne*. Ved Undersøgelse af et meget stort Antal har jeg fundet den konstante Afvigelse, at *Trevelyana* har et kort Manubrium, hvorimod dette hos *decussata* er langt poseformet.

Bela Trevelyana, Turt.

Pl. VIII, figs. 7—10, Pl. X, figs. 10—11.

Pleurotoma Trevellianum, Turton, Ann. & Mag. of Nat. Hist. Vol. VII, pag. 351.
Mangelia Trevelliana, Forb. & Hanl. Brit. Moll. Vol. III, pag. 452, Pl. CXII, fig. 1, 2.
Pleurotoma Trevelyana, Jeffreys, Br. Conch. Vol. IV, pag. 398.
Bela Trevelyana, G. O. Sars, op. c. pag. 235, Pl. XVI, fig. 13.

This species is in a high degree variable in form, and just as it attains its greatest size in the arctic regions does it, also, there, undergo its greatest variation. As a rule, the spire is as long, or longer than the aperture; the whorls angulated; the axial ribs numerous, not very prominent, and straight; the spiral lines numerous, but irregular in strength.

Apex (fig. 9 *b, c*) obtusely rounded, and, on the first whorl, a double-ribbed spiral sculpture makes its appearance. The axial sculpture very faint.

Operculum. Fig. 9 *a*.

The typical arctic form is illustrated in fig. 7 and 8.

Fig. 9 is a peculiar, short-spired form from Tromsø, where it is not rare, and

Fig 10 is a form from the same place, having uncommonly few ribs.

The *teeth* (Pl. X, fig. 10—11) are dagger-shaped, with a pretty short manubrium.

Habitat: Stats. Nos. 223, 224, 261, 267, 270, 273, 326, 357. Bodø, Tromsø and Hammerfest, in from 10—197 fathoms deep.

Although I affirm *B. Trevelyana* and the following *B. decussata*, to be distinct species, there is, yet, a very close relationship between them, and forms occur to which we can with difficulty assign a place.

Under *B. decussata* I have included a variety *finmarchia*. I was for a long time uncertain where it should be placed, but I think it has found its true position now. Prof. Verrill has sent me from America, as *B. decussata*, Couth, this variety precisely, which has given confirmation to my view of it.

A few characteristics are apparent, which will always serve to destinguish *B. Trevelyana* from *decussata*, First, there is the apex. This is, in the first named, rather flattened, whilst in the last named, it is mammiform. Next, the axial ribs in *Trevelyana*, are straight, and less prominent than in *decussata* where they, besides being more elevated, are always more or less curved, but in this last characteristic they are however interchangeable. Finally we have the *teeth*. After the investigation of a very large number, I have found the constant difference, that *Trevelyana* has a short manubrium, whilst in *decussata* it is long bag-shaped.

Bela Trevelyana er af Dr. Jeffreys og Verkrüsen angivet fra Nord Amerikas Østkyst, men Verrill[1] opfører den blandt de tvivlsomme Arter og tilføier, at han har ikke seet noget amerikansk Exemplar, som han med Sikkerhed kunde henføre til denne Art[2]. Blandt Verrills Varieteter af *B. decussata* er en „*pusilla*“,[3] hvorom han siger, at den ligner der europæiske *B. Trevelyana*, „but is shorter and less decidedly cancellated“, ligesom Ribberne er mindre fremtrædende og mindre bøiede. Dette synes at minde stærkt om den af mig i Fig. 9 afbildede korte Form af *Trevelyana*.

Bela decussata, Couth.

Pl. VIII, Fig. 11—14, Pl. X, Fig. 12—13.

Pleurotoma decussata, Couthouy, Boston Journ. Nat. Hist. II 1839, Pag. 183, Pl. 4, Fig. 8.
Gould, Invert. of Mass. Pag. 280, Fig. 185.
Defrancia viridula, Møll. Krøyers Tidsskr. 1842, Pag. 87.
Bela decussata, Verrill, Cat. mar. Moll. 1882, Pag. 479, Pl. XLIII, Fig. 13.
Bela conoidea, G. O. Sars, Moll. reg. Arc. Pag. 236, Tab. 16, Fig. 14.

Formen varierer fra kort oval til langtstrakt fusiform, Vindingerne afrundede eller kun svagt kjølede, de axiale Ribber bøiede og stærkt fremtrædende rundt den øvre Del af Vindingerne, Spirallinierne fine, indskaarne.

Apex Fig. 12 *a*, *b* glat, Mammilliform, den første Vinding har kun en svag, utydelig Spiralsculptur, hvorimod de axiale Folde er overveiende stærkest.

Fig. 12 og 13 er, hvad jeg holder for typiske Former. Den første er fra Tromsø og den sidste fra St. 267—148 Favne.

Var. finmarchia, nob.

Pl. VIII, Fig, 11

Formen kort oval fusiform, Vindingerne svagt kjølede, de stærkt fremtrædende axiale Ribber ikke meget bøiede[4].

Forekomst: Tromsø, 20 Favne.

[1] Cat. of marine Moll. 1882, Pag. 484.
[2] Herzenstein anfører den (op. c. Pag. 690) fra Murmankysten.
[3] Cat. of marine Moll. 1882, Pag. 481.
[4] Ribbernes Bøining er dog noget stærkere end angivet paa Fig 11; dette gjælder og Fig. 12.

Bela Trevelyana is stated by Dr. Jeffreys, and Verkrüzen, to pertain to the East coast of North America, but Verrill[1] classes it amongst the doubtful species, and adds that he has not seen any American specimens which he could with certainty assign to this species[2]. Amongst Verrill's varieties of *B. decussata*, there is a „*pusilla*“[3], of which he says, that it resembles the European *B. Trevelyana*, „but is shorter, and less decidedly cancellated“ whilst the ribs, also, are less prominent, and less curved. That appears to point strongly to the short form of *Trevelyana* I have illustrated in fig. 9.

Bela decussata, Couth.

Pl. VIII, fig. 11—14, Pl. X, fig. 12, 13.

Pleurotoma decussata, Couthouy, Boston Journ. Nat. Hist. Vol. II, 1839, pag. 183, Pl. IX, fig. 8.
Gould, Invert. of Mass. pag. 280, fig. 185.
Defrancia viridula, Møll. Krøyer's Tidsskrift 1842, pag. 87.
Bela decussata, Verrill, Cat. Marine Moll. 1882, pag. 479, Pl. XLIII, fig. 13.
Bela conoidea, G. O. Sars, Moll. reg. Arc., pag. 236, Pl. XVI, fig. 14.

The shell varies, from short-ovate to elongate-fusiform. The whorls rounded, or only faintly angulated; the axial ribs curved, and strongly prominent round the upper part of the whorls. The spiral lines fine and imprinted.

Apex (fig. 12 *a*, *b*) smooth, mammiform; the first whorl has only a faint, indistinct, spiral sculpture; whilst the axial ribs are by far the strongest.

Fig. 12 and 13 are, what I consider to be, typical forms. The former is from Tromsø, and the latter from Station 267. Depth 148 fathoms.

Var. finmarchia, nob.

Pl. VIII, fig. 11.

The form short ovo-fusiform; the whorls faintly angulated; the strongly prominent axial ribs not much curved[4].

Habitat: Tromsø. — Depth, 20 fathoms.

[1] Cat. of Marine Moll. 1882, pag. 484.
[2] Herzenstein states (op. c. pag. 690) that it pertains to the Murman Coast.
[3] Cat. of Marine Moll. 1882, pag. 481.
[4] The curving of the ribs is however, somewhat greater than shown in fig. 11. The same remark applies to fig. 12.

Var. **conoidea**, Sars.

Tab. VIII, Fig. 14.

Bela conoidea, G. O. Sars, op. c. Pag. 236.

Formen langtstrakt fusiform, Vindingerne lidet convexe, de axiale Ribber stærkt bøiede; Sculpturen er forøvrigt finere end den typiske.

Apex Fig. 14 *a* adskiller sig ikke noget væsentlig fra den typiske.

Forekomst: 323. 363 fra 223 til 259 Favne[1]

Tænderne (Pl. X, Fig. 12—13) adskiller sig fra foregaaende Arts ved et længere Manubrium.

At *B. decussata* og *virdula*, Möll. er samme Art, har jeg havt Anledning til at overbevise mig om ved at sammenligne Exemplarer af Møllers Typesamling og amerikanske fra Prof. Verrill. Overgangen til *B. conoidea*, Sars har min Ven Schneider sendt mig saa fuldstændig, at dens Stilling som Varietet hos mig ikke efterlader Spor af Tvivl. Ogsaa Dr. Jeffreys havde samme Opfatning.

Bela viridula, G. O. Sars er efterfølgende Art.

Bela Kobelti, Verk.

Pl. VIII, Fig, 15 (Apex).

Bela Kobelti, Verkrüzen, Nachrichtsbl. 1876, No. 2, Pag 17.
Bela Kobelti (Verkrüzen) Kobelt, Jahrb. Mal. Gesell. 1876, Pag. 178, Pl. 4, Fig. 5.
Bela viridula, G. O. Sars, op. c. Pag. 235, Pl. 16, Fig. 7, 8.

I Form ligner denne Art meget *B. Trevelyana*, men sidste Vinding er forholdsvis større. Sculpturen, der af Dr. Kobelt paa ovenciterte Sted (Fig. 5 *a*) er godt gjengivet i sine Detaljer, er hos *Kobelti* let adskillelig ved Spiralliniernes høist uregelmæssige Styrke og Kanalen er mere aaben end hos *Trevelyana*.

Apex (Fig. 15) er glat, mammilleformig og første Vinding har 2 Spiralribber.

Forekomst: St. 283—767 Favne, 2 døde Exempl.

Jeg har kun havt Anledning til at se faa Exemplarer af denne Art, men jeg skulde tro, at den vil vise sig at være god. Den forholdsvis store Hovedvinding og den aabne Kanal er karakteristisk.

Tænderne har jeg ikke faaet Anledning til at undersøge, men efter Sars maa de staa nær *B. decussata*.

Arten er forøvrigt kun kjendt fra Finmarken. Den ovenfor angivne Lokalitet er Vest af Bereneiland.

[1] Herzenstein angiver den fra Murmankysten.

Var. **conoidea**, Sars.

Pl. VIII, fig. 14.

Bela conoidea, G. O. Sars, op. c. pag. 236.

The form elongate-fusiform; the whorls little convex; the axial ribs strongly curved; the sculpture, otherwise, is finer than in the typical form.

Apex (fig. 14 *a*) does not materially differ from the typical one.

Habitat: Stats. Nos. 323, 363 in from 223 to 259 fathoms[1].

The *teeth* (Pl. X, fig. 12, 13) differ, from those of the preceding species, in having a longer manubrium.

I have had an opportunity of convincing myself that *B. decussata* and *viridula*, Moll. are the same species, by comparison of specimens from Mollers typical collection, and American ones from Prof. Verrill. My friend Mr. Schneider has sent me such complete transitions, that the position of *B. conoidea* as a variety remains, for me, no longer doubtful. Dr. Jeffreys arrived at the same conclusion.

Bela viridula, G. O. Sars is the following species.

Bela Kobelti, Verk.

Pl. VIII, fig. 15 (Apex).

Bela Kobelti, Verkrüzen, Nachrichtsbl. 1876, No. 2, pag. 17.
Bela Kobelti (Verkrüzen) Kobelt, Jahrb. Mal. Gesell. 1876, pag. 178, Pl. IV, fig. 5.
Bela viridula, G. O. Sars, op. c. pag. 235, Pl. XVI, fig. 7. 8.

The shell much resembles that of *B. Trevelyana*, but the ultimate whorl is relatively larger. The sculpture — whose details are well represented by Dr. Kobelt, in the above op. cit. (fig. 5 *a*) — is, in *Kobelti*, easily distinguished by the very irregular strength of the spiral lines, and the canal is also more open than in *Trevelyana*.

Apex (fig. 15) is smooth and mammiform, and the first whorl has two spiral ribs.

Habitat: Stats. Nos. 283. in 767 fathoms. 2 dead specimens.

I have only had an opportunity of seeing a few specimens of this species, but I rather think it will prove to be a distinct one. The relatively large Body whorl, and the open canal are characteristic.

The *teeth*; I have not had an opportunity of examining these, but, according to Sars, they must be allied to *B. decussata*.

The species is, otherwise, only known from Finmark. The locality above named is to the west of Beeren Island.

[1] Herzenstein states that it pertains to the Murman Coast.

Bela tenuicostata, M. Sars.

Tab. VIII, Fig. 16—17, Tab. X, Fig. 14.

Pleurotoma tunuicostata, M. Sars, Vid. Selskb. Forh. 1868, Pag. 259.

Bela tenuicostata, G. O. Sars, op. c. Pag. 237, Pl. 17, Fig. 1 *a*, *b*.

Formen oval, Vindingerne tumide, de axiale Ribber, der hos den typiske Form er svage og talrige, kan variere meget baade i Antal og Styrke, men er altid stærkt boiede. Spirallinierne overordentlig fine; i Mundaabningens øvre Ende er en dyb og bred Sinus[1].

Apex (Fig. 17 *a*, *b*) ligner *B. decussata*.

Operculum (Fig. 17 *c*) ovalt.

Var. **Willei**, Fr.

Pl. VIII, Fig. 16, 17.

Pleurotoma (Bela) Willei, Friele, Prelim. Rep. on Moll. (Nyt Mag. Bd. XXIII) 1877, Pag. 9.

De axiale Ribber baade færre og kraftigere end hos den typiske. Begge Former forekommer ofte sammen, men paa de store Dyb er Varieteten ulige hyppigst.

Tænderne, Tab. X, Fig. 14, er ikke væsentlig forskjellig fra *B. decussata*.

Forekomst: St. 18, 40, 79, 87, 124, 137, 164, 192, 195, 200, 225, 251, 259, 273, 312, 323 & 362 fra 100 til 1215 Favne.

Af Jeffreys angives den fra Biscayer-Bugten 717 Favne („Lightning Fxped.") og 1450 Favne „Valorous" Exped.

Prof. Verrill[2] angiver den fra Ny Englands Kyst til 1290 Favne.

Bela ovalis, Friele.

Pl. VIII, Fig. 21, 22, Pl. X, Fig. 19.

Pleurotoma (*Bela*) *ovalis*, Friele, Prelim. Rep. Moll. (Nyt Mag. XXIII) 1877, Pag. 9, Fig. 5.

Pleurotoma exigua, Jeffreys, Proc. Zool. Soc. 1883 („Triton" Exped.) Pag. 399, Pl. XLIV, Fig. 10.

Bela pygmæa, Verrill, Cat. mar. Moll. 1882, Pag. 460, Pl. LVII, Fig. 8.

Formen fusiform oval, Spiret kortere end Mundaabningen, Vindingerne tumide, Kanalen kort og meget aaben;

[1] Sinus forekommer hos alle Bela Arter med sigmalbøiede Axialribber og hvor Bøiningen er stærkest, er ogsaa Sinus mest fremtrædende.

[2] Third Cat. of Moll. 1885, Pag. 419.

Bela tenuicostata, M. Sars.

Pl. VIII, fig. 16, 17, Pl. X, fig. 14.

Pleurotoma tenuicostata, M. Sars, Vid. Selskb. Forh. 1868 pag. 259.

Bela tenuicostata, G. O. Sars, op. c. pag. 237, Pl. XVII, fig. 1 *a*, *b*.

The shell oval; the whorls tumid; the axial ribs — which, in the typical form are faint and numerous — may vary, both in number and strength, but are always strongly curved; the spiral lines extraordinarily fine; in the upper part of the aperture there is a deep and wide sinus[1].

Apex (fig. 17 *a*, *b*) resembles that of *B. decussata*.

Operculum (fig. 17 *c*) oval.

Var. **Willei**, Friele.

Pl. VIII, fig. 16, 17.

Pleurotoma (*Bela*) Willei, Friele, Prelim. Rep. on Moll. (Nyt Mag. Bd. XXIII) 1877, pag. 9.

The axial ribs, both fewer and stronger than in the typical form. Both forms occur, often together, but in the vast depths the variety occurs by far the most frequently.

The *teeth* (Pl. X, fig. 14) do not materially differ from those of *B. decussata*.

Habitat: Stats. Nos. 18, 40, 79, 87, 124, 137, 164, 192, 195, 200, 225, 251, 259, 273, 312, 323 and 362 in from 100 to 1215 fathoms.

It is stated by Jeffreys to pertain to the Bay of Biscay — 717 fathoms (Lightning Exped.) and 1450 fathoms (Valorous Exped.).

Prof. Verrill[2] states it as pertaining to the coast of New England in 1290 fathoms.

Bela ovalis, Friele.

Pl. VIII, fig. 21, 22, Pl. X, fig. 19.

Pleurotoma (*Bela*) *ovalis*, Friele, Prelim. Rep. Moll. (Nyt Mag. XXIII) 1877, pag. 9, fig. 5.

Pleurotoma exigua, Jeffreys, Proc. Zool. Soc. 1883 („Triton" Exped.) pag. 399, Pl. XLIV, fig. 10.

Bela pygmæa, Verril, Cat. Mar. Moll. 1882, pag. 460, Pl. LVII, fig. 8.

The form ovo-fusiform, the spire shorter than the aperture; the whorls tumid; the canal short and very

[1] The sinus occurs in all the Bela species with sigmoidal axial ribs, and where the curve is greatest, the sinus is also, there, most prominent.

[2] Third Cat. of Moll. 1885, pag. 419.

Sculpturen bestaar af meget fine Spirallinier og talrige, lidet bøiede, svage axiale Ribber, der ofte gaar over til fine Linier eller Vækststriber hvorved dannes et fint Netværk.

Apex, Fig. 22 *a*, stump og glat. Første Vinding har omtrent samme Sculptur som de øvrige.

Operculum ovalt.

Tænderne, Tab. X, Fig. 19, ligne *Bela Trevelyana*.

Forekomst: St. 35, 40, 240, 295, 283, 312 og 353 fra 658 til 1333 Favne.

Dr. Jeffreys sendte mig med sin sædvanlige Imødekommenhed *Pleurotoma exigua* fra „Triton" Exped. til Sammenligning, men naar undtages, at den axiale Sculptur hos denne var noget kraftigere end paa mine Exemplarer fra de større Dyb i Nordhavet, fandt jeg ingen nævneværdig Afvigelse, og jeg kan derfor ikke betragte dem som artsafvigende. Jeg skylder dog at tilføie, at min afdøde Ven var ikke enig med mig i denne Opfatning. Prof. Verrill har ligeledes været saa venlig at sende mig flere Exemplarer af *Bela pygmæa*. Disse stemme fuldstændig med vor Art. Verrill angiver Dybdeforholdene for *B. pygmæa* i „2d Catalog" 1883 fra 312 til 1290 Favne.

open. The sculpture consists of very fine spiral striations and numerous, but slightly curved, faint, axial ribs which, frequently, pass into fine striations, or lines of growth and, thus, form a delicate reticulation.

Apex (fig. 22 *a*) blunt and smooth. The first whorl has a sculpture much similar to the others.

Operculum oval.

The *teeth* (Pl. X. fig. 19) resemble those of *Bela Trevelyana*.

Habitat: Stats. Nos. 35, 40, 240, 283, 295, 312, 353, in from 658 to 1333 fathoms.

Dr. Jeffreys with his usual amiability sent me, for comparison, *Pleurotoma exigua* from the „Triton" Expedition, but, with exception that the axial sculpture was somewhat stronger than in my specimens from the vast depths of the North Atlantic ocean, I found no variation worthy of notice, between it and *B. ovalis*, and I cannot, therefore, consider them as distinguishable species. I ought, however, to add that my friend did not concur in this conclusion with me. Prof. Verrill has, also, been so kind as to send me several specimens of *Bela pygmæa*. These accord, completely, with our species. Verrill gives the Soundings for *B. pygmæa* in "2nd Catalogue" 1884, as, from 312 to 1290 fathoms.

Bela bicarinata, Couth.

Pl. VIII, Fig. 18, 19, Pl. X, Fig. 15, 16.

Pleurotoma bicarinata, Couthouy, Boston Journ. Nat. Hist. II 1839, Pag. 104, Pl. 1, Fig. 11.

Pleurotoma violacea, Migh. Proc. Boston Soc. Nat. Hist. I 1841, Pag. 50.

Defrancia cylindracea, livida & Beckii, Møller, Krøyers Tidsskr. 1842, Pag. 86 & 87.

Bela bicarinata & violacea, G. O. Sars, Moll. reg. arc. Pag. 237, Tab. 16, Fig. 11, 12 & Tab. 17, Fig. 2, 3.

„ *bicarinata*, Verrill, Cat. mar. Moll. 1882, Pag. 482, Pl. LVII, Fig. 16.

At karakterisere denne Art er høist vanskeligt, thi baade Form og Sculptur er mere vexlende end i nogen anden af hele Slægten. Snart er Formen oval med Spiret omtrent af samme Længde som Mundaabningen, snart fusiform med et længere stærkt tilspidset Spir; Vindingerne er snart kjølede, snart afrundede cylindriske; Sculpturen er snart overveiende kraftigst i den axiale Retning, snart i den transversale. Den typiske *bicarinata* har saaledes meget stærke Spiralribber uden anden axial Sculptur end Vækststriber, hvorimod Varieteterne *violacea* og *cylindracea* ofte har ganske kraftige axiale Ribber og disse er altid, selv om de kun optræder som Vækststriber, bøiede. Mest

Bela bicarinata, Couth.

Pl. VIII, figs. 18, 19, Pl. X, figs. 15, 16.

Pleurotoma bicarinata, Couthouy, Boston Journal Nat. Hist. II 1839, pag. 105, Pl. I, fig. 11.

Pleurotoma violacea, Migh. Proc. Boston Soc. Nat. Hist. I 1841, pag. 50.

Defrancia cylindracea, livida & Beckii, Møller, Krøyer's Tidskr. 1842, Pl. 86, 87.

Bela bicarinata & violacea, G. O. Sars, Moll. reg. arc. pag. 237, Pl. XVI, fig. 11, 12 and Pl. XVII, figs. 2, 3.

„ *bicarinata*, Verrill, Cat. mar. Moll. 1882, pag. 482, Pl. LVII, fig. 16.

It is extremely difficult to characterise this species, because both its form and sculpture are more variable than in any other of the whole genus. Sometimes the form is oval, with the spire about the same length as the aperture, and sometimes it is fusiform, with a long, strongly acuminate spire. The whorls are sometimes angulated and sometimes cylindrically rounded. The sculpture is, often, by far the most prominent in the axial direction, and often, it is so transversally. The typical *bicarinata* has, thus, very prominent spiral ribs devoid of other sculpture than lines of growth, whilst the varieties *violacea* and *cylindracea*, frequently, have quite prominent axial ribs, and

karakteristisk er den ikke meget lange Kauda og dybe, brede Kanal.

Apex byder ingen Støtte som Artsmærke, da den varierer efter Skallens Sculpturkarakter.

Tab. VIII, fig. 18 er en trekarineret Varietet fra 658 Favne (St. 312), der synes at staa nær den af Verrill i ovenciterte Arbeide afbildede. Jeg kan bekræfte Dr. Jeffreys Iagttagelse, at Dybvandsformerne af denne Art er hvide, hvorimod de fra grundt Vand er rødagtig eller rustfarvede.

Tænderne, Pl. X, Fig. 15, 16, er sværdformede med et noget langt Manubrium.

Forekomst: 79, 124, 164, 173 *b*, 192, 200, 251, 260, 290, 312, 359. Magdalenebay (Spitsbergen) fra 30 til 658 Favne.

Var. **geminolineata**, Fr.

Tab. VIII, Fig. 19.

„Catalog d. Spitzbergen Moll.“ (Jahrbücher Mal. Gesell.) 1879, Pag. 277.

Formen fusiform, Spiret stærkt tilspidset og længere end Mundaabningen. Den axiale Sculptur bestaar kun af svage Vækststriber, Spiralsculpturen derimod af parvis optrædende Linier; paa næstsidste Vinding er der 4 saadanne Liniepar.

Der blev kun fundet et Exemplar paa 5 Favne, Adventbay (Spitsbergen).

Denne høist eiendommelig tegnede Varietet kommer Varieteten *lævior* nærmest.

Overgangen fra den typiske *bicarinata* til Formerne *cylindracea violacea* og *lævior* ligger fuldstændig foran mig. Fra St. 192 og 312, 650 og 658 Favne, altsaa Artens dybeste Forekomst, haves Formerne: *bicarinata*, *cylindracea* og *lævior*. Jeg opfatter her *violacea* i Overensstemmelse med Prof. G. O. Sars[1].

I begge disse Tilfælde viser det sig, at unge Individer har den skarpeste og stærkest udprægede Sclulptur, hvorimod de ældre, omend fuldstændig vel bevarede, har Tilbøielighed kun at bevare den underordnede Spiralskulptur. Dette stemmer i sine Principer overens med Prof. Verrills Iagttagelser[2].

[1] Moll. reg. arc. Pl. 17, Fig. 2.

[2] Cat. of Mar. Moll. 1882, Pag. 483.

these are invariably — even if they only occur as lines of growth — curved. The most characteristic feature is the, not very long, cauda, and the deep wide canal.

Apex gives no assistance as a specific feature, because it varies according to the sculptural character of the shell.

Pl. VIII, fig. 18 is a triply carinated variety, from 658 fathoms (station 312), which appears to be allied to that illustrated by Verrill, in the above cited work. I can confirm Dr. Jeffreys observation that the deep-water forms of this species are white, whilst those from the shallow-water are reddish, or rusty, in colour.

The *teeth*, Pl. X, fig. 15, 16, are ensiform, with a somewhat long manubrium.

Habitat: Stats. Nos. 79, *124*, *164*, *173 b*, *192*, *200*, 251, 260, 290, 312, 359. Magdalene Bay (Spitzbergen) in from 30—658 fathoms.

Var. **gemminolineata**, Friele.

Pl. VIII, fig. 19.

Catalog d. Spitzbergen Moll. (Jahrbücher Mal. Gesell) 1879, Pag. 277.

The shell fusiform; the spire strongly acuminate, and longer than the aperture. The axial sculpture consists of, only faint lines of growth, whilst the spiral sculpture consists of lines occurring in pairs; in the penultimate whorl there are 4 pairs of such lines.

There was found, only one specimen, in 5 fathoms depth, at Advent Bay (Spitzbergen).

This highly remarkably distinguished variety approaches most to the variety *lævior*.

The transition, from the typical *bicarinata* to the forms *cylindracea violacea* and *lævior*, lies completely before me. From Stations 192 and 312, in 650 and 658 fathoms, consequently its deepest occurrence, we have the forms *bicarinata*, *cylindracea* and *lævior*. I regard *violacea* in accordance with Prof. G. O. Sars[1]

In both these cases, it is apparent that young individuals have the sharpest, and most distinctly marked, sculpture, whilst the older ones, although perfectly well preserved, have a tendency to retain only the subordinate spiral sculpture. This accords, in its principles, with Prof. Verrills observations[2].

[1] „Moll. reg. arc.“ Pl. XVII, fig. 2.

[2] Cat. of Mar. Moll. 1882, pag. 483.

Bela Schantarica, Midd.

Pl. VIII, Fig. 20 *a*, *b*, Pl. X, Fig. 17, 18.

Pleurotoma Schantaricum, Middendorff.
Beitr. Mall. Ross. Pag. 118.
„Sibir. Beise" Pag. 223, Pl. XII, Fig. 17—19.
Pleurotoma violacea, var. *gigantea* (Mørch) Leche, „Hafsmoll." Sv. Vet. Akad. Handl., Bd. 16, Pag. 57, Tab. 1, Fig. 19.

Formen oval fusiform. Vindingerne tumide, undertiden svagt kjølede, undertiden afrundede (det sidste hyppigst). Mundaabningen længere end Spiret og ikke meget udvidet. Kanalen kort og bred; Sculpturen, fine, tætte undulerede Spirallinier og axiale Folde, der hos udvoxne Exemplarer paa sidste Vinding ofte næsten forsvinde; hvorimod de altid vil gjenfindes paa de øvre Vindinger.

Om *Apex* kan jeg intet oplyse, da alle mine Exemplarer har denne Del af Skallen eroderet.

Operculum, Fig. 20 *b*.

Tænderne, Tab. X, Fig. 17—18, sværdformede med et kort Manubrium.

Forekomst: Spitzbergen (Magdalenebay) 30—50 Favne.

Dr. Jeffreys holdt denne Form for kun en Varietet af *B. simplex*, Midd. Jeg tør ikke paastaa, at man maaske ikke skulde finde Mellemformer imellem disse to, men uagtet jeg har ganske vakre Svitter af begge for mig, har jeg dog ikke seet nogen Tilnærmelser.

Bela simplex er altid glat med en fin chagrineret Spiralsculptur og et meget kort Spir. *B. Schantarica* mangler derimod aldrig Længdefolde paa de øvre Vindinger, og hos unge Individer (Fig. 20 *a*) er disse ogsaa paa Hovedvindingen stærkt fremtrædende, og Spiret, naar det ikke er for stærkt eroderet, forholdsvis længere.

Prof. Leche[1] kommer til samme Resultat, at begge disse Former ikke godt kan sammenblandes, og fremhæver yderligere, hvad ogsaa er noteret i ovenstaaende Diagnose, at Vindingerne er svagt vinklede hos sidstnævnte Art. Leche holder imidlertid begge Former for Varieteter af *Bela violacea*, Migh.

I Proc. of U. S. Nat. Museum Pag. 524, Pl. II, Fig. 8 har Prof. W. H. Dall beskrevet en *Bela murdochiana*, som staar Middendorffs Art meget nær. Sculpturen kan passe og det meget korte Spir synes efter Tegningen at dømme, at skyldes en stærk Erodering. Da jeg imidlertid ikke har seet Exemplaret, tør jeg ikke udtale mig afgjørende.

[1] Op. c. Pag. 58.

Bela Schantarica, Midd.

Pl. VIII, figs. 20 *a*, *b*, Pl. X, fig. 17, 18.

Pleurotoma Schantaricum, Middendorff, Beitr. Mall. Ross pag. 118.
„Sibir. Reise" pag. 223, Pl. XII, fig. 17—19.
Pleurotoma violacea, var. *gigantea* (Mørch) Leche, „Hafsmoll." Sv. Vet. Akad. Handl., Bd. XVI, pag. 57, Pl. I, fig. 19.

The shell ovo-fusiform; the whorls tumid, occasionally faintly angulated, occasionally rounded (most frequently the last). The aperture longer than the spire and not much dilated; the canal short and wide; the sculpture consists of fine, close, undulated spiral striations and axial folds, which, in adult specimens, often, almost disappear on the ultimate whorl, whilst they, invariably, are recognised on the upper whorls.

Apex. Regarding it I can say nothing, as in all my specimens this part of the shell was eroded.

Operculum, fig. 20 *b*.

The *teeth* (Pl. X, figs. 17—18) ensiform, with a short manubrium.

Habitat: Spitzbergen (Magdalene Bay) 30-50 fathoms.

Dr. Jeffreys considered this form to be only a variety of *B. simplex*, Midd. I dare not affirm that we may not, perhaps, be able to discover forms intermediate between these two, but although I have before me very complete consecutive sets of both of them, I have been unable to detect any approaches to each other.

Bela simplex is always smooth, with a fine chagreen-like spiral sculpture, and a very short spire. *B. Schantarica*, on the other hand, is never without longitudinal folds on the upper whorls, and in young individuals (fig. 20 *a*) these are prominent on the body whorl, and the spire is, when not too greatly eroded, relatively longer.

Prof. Leche[1] arrives at the same conclusion, viz. that these two forms cannot well be placed together, and accentuates, further, what has also been stated in the above diagnosis; that the whorls are faintly angular in the last named species. Leche, however, considers both forms to be varieties of *Bela violacea*, Migh.

In the Proceedings of the U. S. Nat. Museum, p. 524, Pl. II, fig. 8, Prof. W. H. Dall has described a *Bela murdochiana* which is closely allied to Middendorff's species. The sculpture accords, and the very short spire appears, to judge from the illustration, to be due to a strong erosion. As I have, however, not seen the specimen I cannot speak definitely.

[1] Op. c. pag. 58.

Bela impressa, Beck.

Tab. VIII, Fig. 1—2, Tab. X, Fig. 9.

Pleurotoma (Ischnula) *impressa* (Beck) Mørch, Cat. Moll. Spitzberg. 1869, Pag. 17.

Pleurotoma impressa, Leche, Sv. Akad. Handl. (Hafsmollusker) B. 16, No. 2, Pag. 54, Tab. 1, Fig. 16.

Denne Arts Eiendommelighed ligger væsentlig i Skulpturen, der bestaar af 16 til 20 dybe axiale Furer paa sidste Vinding og de 7 til 10 indskaarne Spirallinier staa især paa den øvre Del af Hovedvindingen temmelig fjernede fra hinanden. Vindingerne ere stærkt vinklede. Farven er brun eller rødlig.

Apex, Fig. 1 *b*, er mamilleformig, ophøiet og første Vinding har skarpe Spiralribber.

Operculum Fig. 1, ovalt piriform.

Tænderne Tab. X, Fig. 9 *a—d*, er smalle, sværdformede med et kort Manubrium.

Forekomst: Spitzbergen (Magdalenebay og Adventbay) fra 30 til 60 Favne. Leche angiver den fra Novaja Semblia og det Kariske Hav[1].

[1] Krause („Moll. Behringsmeeres") har fundet den i Behringshavet og S. Hertzenstein („Fauna der Murmanküste" etc.) angiver den fra Murmankysten.

Bela Sarsi, Verrill.

Tab. VIII, Fig. 3—5, Tab. X, Fig. 7—8.

Bela cancellata, G. O. Sars (non Migh.), Moll. reg. Arc. Pag. 224, Tab. 23, Fig. 3.

Bela Sarsi, Verrill, Proc. U. S. Nat. Museum Vol. III 1880, Pag. 364.

Imellem denne og foregaaende Form er der et meget nært Familieskab. Den væsentligste Forskjel er: *Bela Sarsi* har et forholdsvis længere Spir, de axiale Furer er bredere og Ribberne bliver derved mere afrundede; Spirallinierne har præcis samme Karakter som *B. impressas*, men staar som Regel tættere.

Apex, Fig. 3 *a*, har en lidet udviklet Sculptur paa første Vinding, men denne Karakter maa ikke tillægges stor Betydning, da den er lidet konstant og dertil er Apex sjelden at finde i tilfredsstillende, velbevaret Stand.

Operculum, Fig. 3 *b*, piriform.

Tænderne, Tab. X, Fig. 7, 8 er ikke afvigende fra foregaaende Arts.

Forekomst: Tromsø 10—20 Favne.

Bela impressa, Beck.

Pl. VIII, figs. 1—2, Pl. X, fig. 9.

Pleurotoma (Ischnula) *impressa*, (Beck) Mørch, Cat. Moll. Spitzberg. 1869, p. 17.

Pleurotoma impressa, Leche, Sv. Akad. Handl. (Hafsmollusker) B. 16, No. 2, pag. 52, Pl. I, fig. 16.

The peculiarity of this species lies, principally, in the sculpture, which consists of 16 to 20 axial furrows on the ultimate whorl, and in the 7 to 10, impressed, spiral, striations being placed — especially in the upper part of the Body whorl — pretty far apart from each other. The whorls are strongly angular. The colour is brown, or reddish.

Apex (fig. 1 *b*) is mammiform, elevated, and the primary whorl has two strong spiral ribs.

Operculum (fig. 1) oval-piriform.

The *teeth* (Pl. X, fig. 9 *a—d*) are slender, ensiform, with a short manubrium.

Habitat: Spitzbergen (Magdalene Bay and Advent Bay) from 30 to 60 fathoms. Leche states it as pertaining to Nova Zembla, and the Kara sea.[1]

[1] Krause (Moll. Behringsmeeres) has found it in Behrings sea and S. Hertzenstein (Fauna der Murmanküste etc.) states it as pertaining to the Murman coast.

Bela Sarsi, Verrill.

Pl. VIII, figs. 3—5, Pl. X, figs. 7—8.

Bela cancellata, G. O. Sars (non Migh.), „Moll. reg. arc." pag. 224, Pl. XXIII, fig. 3.

Bela Sarsi, Verrill, Proc. U. S. Nat. Museum Vol. III 1880, pag. 364.

Between this and the preceding form there is a very intimate family relationship. The chief divergence is, that *Bela Sarsi* has a relatively longer spire; the axial grooves are broader, and the ribs become, thus, more rounded. The spiral striations have precisely the same character as those of *B. impressa*, but are placed, as a rule, closer together.

Apex, (fig. 3 *a*) has a little-developed sculpture on the first whorl, but no great stress can be laid on this feature as it is very inconstant, besides which, the Apex is rarely obtained in a satisfactorily well-preserved condition.

Operculum, (fig. 3 *b*) piriform.

The *teeth*, (Pl. X, fig. 7, 8) do not differ from those of the preceding species.

Habitat: Tromsø, 10—20 fathoms.

Det er høist paafaldende at Tromsø og rimeligvis Finmarken, er det eneste Sted, denne Art er paatruffen paa europæisk Side. Fra den amerikanske Side angives den af Miss Bush (Proc. U. S. Nat. Mus. 1883, Pg. 237) fra Labrador 10—15 Favne. Jeg er ikke utilbøielig at holde den for en Lokalvarietet af *B. impressa*[1].

Bela Koreni, n. sp.

Tab. VIII, Fig. 23, *a*.

Formen cylindrisk fusiform, Vindingerne 4, afrundede, noget tumide, Suturen er grund, Mundaabningen ikke meget aaben, og omtrent halve Skallens Længde, Canalen ret, kort og vid, forneden ret afskaaren; Skulpturen bestaar af saa godt som rette axiale Ribber (10 paa sidste Vinding) der kun paa øverste Del af Vindingen er tydelig fremtrædende, og temmelig svage, men noget tætstaaende Spirallinier. Læben, der er noget brudt, synes at have tydelig Tegn til Sinus.

Apex, Fig. 23 *a*, stump; paa første Vinding er 3 svage Spiralribber synlige.

Størrelse: 5mm Axiallængde, 2.2mm Diameter.

Forekomst: St. 192—649 Favne. Kun et Exemplar.

Det gjør Indtrykket af at være et ungt Individ, men jeg kan ikke henføre den til nogen af de bekjendte Arter. Skulpturen er hos alle de nordiske Belaarter meget kraftig udviklet hos unge Individer, men hos vor Art er den svag og utydelig. Skal man derfor drage Analogi fra det almindelige, saa vil *B. Koreni* som udviklet være nær glat, kun vil rimeligvis en svag Spiralstriering være synlig.

Bela exarata, Møll.

Tab. VIII, Fig. 24 (Operculum).

Defrancia exarata, Møller, Krøyers Tidsskr. 1842, Pag. 85.
Tritonium mitrula, Lovén, „Oversigt Vetsk. Acad." („Index Moll.") 1846, Pag. 145.

[1] Krause (Moll. Fauna Beringsmeeres Pag. 279) udtaler sig ogsaa om det paafaldende Familieskab imellem disse to Former. Ganske mærkeligt er det ogsaa, at Herzenstein ikke har fundet *B. Sarsi* ved Murmanske Kysten eller Hvidehavet, men kun *B. impressa*.

It is very remarkable that Tromsø (and probably Finmark) is the only locality on the European side where this species is met with. From the American side, it is stated by Miss Bush (Proc. U. S. Nat. Mus. 1883 p. 237) to pertain to Labrador — 10—15 fathoms — I am not indisposed to consider it as a local variety of *B. impressa*[1].

Bela Koreni, n. sp.

Pl. VIII, fig. 23, *a*.

Shell cylindrical, fusiform; whorls 4, rounded, somewhat tumid. The suture shallow; the aperture not very open and about half the length of the shell; the canal straight short and wide, and at the extremity truncately transsected. The sculpture consists of nearly straight axial ribs (10 on the ultimate volution) which are, on the upper part of the volution, alone, distinctly visible, and of pretty faint, but somewhat close-set, spiral striations. The lip, which is somewhat broken, appears to bear distinct trace of a sinus.

Apex, (fig. 23 *a*) obtuse; on the primary whorl there are 3 faint spiral striations visible.

Size. Axial length 5mm, Diameter 2.2mm.

Habitat: Stats. No. 192. Depth 649 fathoms. One specimen only.

This specimen gives the impression of being an immature one, but I can not assign it to any of the known species. The sculpture in all the Northern Belas, is very strongly developed in the still young specimens, but in this species it is faint and indistinct. If we, therefore, reason from analogy with the general species, *B. Koreni*, when mature, should be almost smooth, with only, probably, a faint spiral striation visible.

Bela exarata, Møll.

Pl. VIII, fig. 24 (Operculum).

Defrancia exarata, Møller, Krøyer's Tidsskr. 1842, pag. 85.
Tritonium mitrula, Lovén, Oversigt Vetsk. Acad. (Index Moll.) 1846, pag. 145.

[1] Krause (Moll. Fauna Beringsmeeres pag. 279) speaks, also, of the striking family relationship between these two forms. It is a striking fact, also, that Herzenstein has not found *B. Sarsi* on the Murman coast, or in the White Sea, but only *B. impressa*.

Bela exarata, G. O. Sars, Moll. reg. arc. Pag 232, Pl. 16, Fig. 18.
B. mitrula, G. O. Sars, l. c. Pag. 233, Pl. 23, Fig. 9.

B. concinnula, Verrill, Cat. Mar. Moll. 1882, Pag. 468, Pl. XLIII, Fig. 15, Pl. LVII, Fig. 11.

Spiret er længere end Mundaabningen og Skulpturen har sin Eiendommelighed i de kraftige Spirallinier, der krydser de axiale Ribber og frembringer paa disse et knudet Ydre.

Operculum Fig. 24 er ovalt piriform.

Tænderne har jeg undersøgt hos et stort Antal Exemplarer, men har ikke fundet dem noget nævneværdig varierende eller afvigende fra Sars's Tegninger.

Forekomst: Tromsø, Hammerfest og Altenfjord fra 10 til 30 Favne. Udenfor Kysten forekom den ikke.

Prof. Leche angiver den fra det kariske Hav indtil 30 Favne og Prof. Verrill har den fra New Englands Kyst indtil 487 Favne. Møller og Dr. Jeffreys angiver den fra Grønland. Den sidste noterer den fra „Porcupine" Exped. 1230 Favne, men der nævnes intet om den forekom levende paa dette Dyb. Den hører neppe nok saa stort Dyb til.

Nye Tegninger af denne og efterfølgende Belaarter har jeg fundet overflødige, da de baade af Sars og for en Del af Verrill er fortrinlige illustrerede, dertil er Formerne i og for sig saa karakteristiske, at nogen Confusion er vanskelig.

Bela harpularia, Couth.

Tab. IV, Fig. 23, 24 (Tænder).

Fusus harpularius, Couthouy, Boston Journ. Nat. Hist. 1838, Pag. 106, Pl. 1, Fig. 10.
Defrancia Woodiana, Møller, Krøyers Tidsskr. 1842, Pg. 86.
Tritonium roseum (M. Sars) Lovén, Overs. Vet. Forh. 1846, Pag. 144.
Bela harpularia, Verrill, Cat. Mar. Moll. 1882, Pag. 473, Pl, XLIII, Fig, 14 & Pl. LVII, Fig. 9.
Bela harpularia, G. O. Sars, Moll. reg. arc. Pag. 234, Tab. 16, Fig. 17 & Tab. 23, Fig. 10.

Under Expeditionen blev den kun fundet i Havnene ved Hammerfest, Tromsø og Bodø, — 10 til 30 Favne.

Med Prof. G. O. Sars maa jeg være enig i, at i alt væsentligt er vor Form overensstemmende med den amerikanske *B. harpularia*, kun er den paa denne Side Oceanet af mindre Størrelse.

Prof. Verrill holder Sars's *B. harpularia* og Varieteten *rosea* for specifik afvigende fra den amerikanske og

Bela exarata, G. O. Sars, Moll. reg. arc. pag. 232, Pl. XVI, fig. 18.
Bela mitrula, G. O. Sars, l. c. pag. 233, Pl. XXIII, fig. 9.
Bela concinnula, Verrill, Cat. Mar. Moll. 1882, pag. 468, Pl. XLIII, fig. 15, Pl. LVII, fig. 11.

The spire is longer than the aperture, and the sculptural peculiarity consists in the strong spiral striations, which traverse the axial ribs and produce with these, a nodulous appearance.

Operculum, (fig. 24) is ovo-piriform.

I have examined the *teeth* in a great many specimens, but have not found them, in any noteworthy degree, varying, or diverging, from Sar's illustrations.

Habitat: Tromsø, Hammerfest, and Alten Fjord, in from 10 to 30 fathoms. Away from the coast, it was not found.

Prof. Leche states it as pertaining to the Kara Sea, up to 30 fathoms deep, and Prof. Verrill has it from the New England coast, up to 487 fathoms. Møller and Dr. Jeffreys state it as pertaining to Greenland. The latter notices it from the „Porcupine" Exped. 1230 faths. but it is not stated whether it occurred living. It can scarcely pertain to such great depths.

I have considered it superfluous to provide new illustrations of this, or the succeeding Bela species, because they are by, both, Sars and, to a certain extent, by Verrill, splendidly illustrated, besides, the forms are in themselves so characteristic, that any confusion is not to be feared.

Bela harpularia, Couth.

Pl. IV, fig. 23, 24 (teeth).

Fusus harpularius, Couthouy, Boston Journ. Nat. Hist. 1838, pag. 106, Pl. I, fig. 10.
Defrancia Woodiana, Møller, Krøyer's Tidssk. 1842, pag. 86.
Tritonium roseum (M. Sars) Lovén, Overs. Vet. Forh. 1846, pag. 144.
Bela harpularia, Verrill, Cat. Mar. Moll. 1882, pag. 473, Pl. XLIII, fig. 14, Pl. LVII, fig. 9.
Bela harpularia, G. O. Sars, Moll. reg. arc., pag. 234, Pl. XVI, fig. 17 & Pl. XXIII, fig. 10.

During the expedition, it was only found in the harbours of Hammerfest, Tromsø, and Bodø. 10 to 30 fathoms.

I agree with Prof. G. O. Sars in regarding this form as, in all essentials, coincident with the American *B. harpularia*, with the difference, only, that on this side of the ocean it is less in size.

Prof. Verrill considers *B. harpulari*., Sars, and the variety *rosea*, to be specifically divergent from the Ameri-

fremhæver, at hin har en forskjellig formet Mundaabning, mere vinklede Vindinger og Ribberne færre og mere fjernede. Ved Sammenligninger af norske og amerikanske Eksemplarer finder jeg ingen nævneværdig Difference i Mundaabningens Form og hvad de øvrige Karakterer angaar, da er disse stærkt vexlende. Som Regel er Ribbernes Antal 14—16, men jeg har Exemplarer for mig med indtil 20. Farven er altid rød eller brunlig. Hos *Bela nobilis* har jeg gjort opmærksom paa, at der imellem Ribberne er en dyb Indskjæring rundt den vinklede Del af Hovedvindingen og at den transverse Sculptur her viser sig uden at være afbrudt af Kjølen. Hos *B. harpularia* er dette ligeledes Tilfælde. Noget andet Slægtskab er der forøvrigt ikke imellem disse to Arter.

Hvad angaar det berettigede i specifik at adskille nærværende Form fra Montagues *B. turricula*, da er jeg ikke utilbøielig at tro, at vor nordlige Form kun er en lokal Varietet og at det maaske vilde være korrektest at opføre den som saadan under Montagues Art.

Allerede Prof. Troschel[1] har gjort opmærksom paa den fra de øvrige *Belaer* høist afvigende Piltand hos *B. turricula* og Sars[2] paaviser en lignende Tand hos *harpularia*.

Jeg har undersøgt en hel Del Exemplarer baade af den hos os forekommende Form og af den sydligere, og har i Tab. IX, Fig. 23 og 24 givet en Række Tegninger af *B. harpularia* og i 25 *a*, *b* af *B. turricula*. Tænderne er yderst tynde, bladformede og synes at veksle betydelig i Form. Muligens er dette dog mere tilsyneladende; thi paa Grund af Tændernes Tyndhed vil det mindste Tryk af Dækglasset have Indflydelse paa Formen og Tændernes vexlende Stillinger giver ligeledes forskjellige Billeder. Den Afvigelse, som der derfor viser sig imellem begge Arters Tænder, kan ikke tillægges nogen Betydning i specifik Retning.

Udenfor N. Europa er Arten kjendt fra Grønland og N. Amerika, men derimod kan man ikke med Sikkerhed notere den under Spitzbergens Fauna. Den norske Exped. fandt den ikke der, men vistnok anfører Dr. Jeffreys den derfra, dog maa den desuagtet staa tvivlsom, da denne Forfatter slaar flere Arter sammen under sin *Pleurotoma turricula*. Prof. Leche angiver den ikke med tilstrækkelig Tydelighed fra det Kariske Hav[3].

[1] Gebiss d. Schnecken Bd. 2, Pag. 44, Tab. IV, Fig. 8.

[2] Moll. reg. arc. Radula Tab. IX. Fig. 3.

[3] Herzenstein (op. c. pag. 688) angiver den derimod fra Murmanske Kysten.

can species, and points out that the former has a differently shaped aperture, more angular volutions and fewer ribs, placed also wider apart. On comparing Norwegian and American specimens, I do not find any noteworthy difference in the form of the aperture, and as regards the other characters, they are very variable. Usually, the ribs are 14—16 in number, but I have specimens before me with as many as 20. The colour is always red, or brownish. In *Bela nobilis*, I have pointed out that the interspaces between the ribs, round the angulatad part of the Body whorl, are concavely excavated and that, there, the transverse sculpture appears without being interrupted by the carina. In *B. harpularia* this is also the case. Any other relationship, however, between these two species does not exist.

As regards the title to separate, specifically, the present form from Montagues *B. turricula*, I am not indisposed to believe that our Northern form is only a local variety, and that it would be, perhaps, most correct to retain it as belonging to Montague's species.

Prof. Troschel[1] has pointed out the arrow-tooth in *B. turricula*, which is so different from that of the other *Belas*, and Sars[2] has shown a similar tooth in *harpularia*.

I have examined a large number of specimens, both, of the form occurring with us and of the Southern one, and in Plate IX, figs. 23, 24 have given a series of illustrations of *B. harpularia*, and in Fig. 25 *a*, *b* of *B. turricula*. The teeth are extremely thin, laminate, and appear to vary considerably in form. Possibly, however, that is more apparent than real, because owing to the thinness of the teeth, the least pressure of the cover-glass will have an influence on the form, and different positions of the teeth give, also, different impressions. The divergence which, therefore, appears between the teeth of both species, cannot be treated as of any importance in specific consideration.

Beyond Northern Europe, the species is known from Greenland and North America but, on the other hand, we cannot state with certainty that it pertains to the fauna of Spitzbergen. The Norwegian Expedition did not find it there but it is the case that Dr. Jeffreys cites it from that locality; it must nevertheless remain doubtful, as that Writer includes several species in his *Pleurotoma turricula*. Prof. Leche states, but not which sufficient distinctness, that it pertains to the Kara sea[3].

[1] Gebiss d. Schnecken Bd. 2, p. 44, Pl. IV, fig. 8.

[2] Moll. reg. arc. Radula Pl. IX, fig. 3.

[3] Herzenstein (op. c. p. 688) cites it, from the Murman coast.

Bela Pingeli, Beck.

Tab. VIII, Fig. 26 *a* (Operculum) Tab. X, Fig. 20 *a* (Tænder).

Defrancia Pingelii (Beck) Møller, Krøyers Tidsskr. Pag. 86.
Bela „ G. O. Sars, op. c. Pag. 223, Pl. 16, Fig. 5.
„ „ Verrill, Cat. mar. Moll. 1882, Pag. 464.

Af alle Belaarter er denne konstantest i Form og Sculptur.

Prof. Verrill giver den følgende gode Karakteristik: „Den er vor slankeste, mest uddragne Art med vel afrundede Vindinger og stærkt cancelleret."

Operculum, Fig. 26, 26 *a*, er hos unge og middelstore Exemplarer piriform med nedre Del stærkt tilspidset og tilsidebøiet (Fig. 26), hvorimod gamle Individer har en stump Spids (Fig. 26 *a*). Det er forøvrigt en oftere iagttaget Foreteelse, at den nederste Del af Operculum bliver afslidt.

Tænderne, Tab. X, Fig. 20, 20 *a*, sværdformige med et noget langt Manubrium.

Forekomst: Hammerfest, St. 262 fra 10 til 147 Favne.

Arten er ikke funden søndenfor Tromsø. Ifølge Jeffreys er den af Torrell fundet ved Spitzbergen; forøvrigt er den kjendt Grønland og N. Amerika.

Bela Pingeli, Beck.

Pl. VIII, fig. 26 *a* (operculum) Pl. X, fig. 20 *a* (teeth).

Defrancia Pingelii (Beck) Møller, Krøyer's Tidsskr. pag. 86.
Bela Pingelii, G. O. Sars, op. c. pag. 223, Pl. 16, fig. 5.
Bela Pingelii, Verrill, Cat. mar. Moll. 1882, pag. 464.

This is the most constant, in form and sculpture, of all the Bela species.

Prof. Verrill characterizes it well in the following words „It is our most slender and elongated species, with broadly rounded whorls and strongly cancellated."

Operculum, fig. 26, 26 *a* is, in young and average-sized specimens, piriform, with the lower part strongly acuminated and curved laterally (fig. 26) whilst old individuals have an obtuse point (fig. 26 *a*). It is, otherwise, a frequently remarked occurrence that the lowest part of the operculum is more or less worn.

The *teeth*, Pl. X, fig. 20, 20 *a* ensiform, with a somewhat long manubrium.

Habitat: Hammerfest. Station No. 262. Depth, 10 to 147 fathoms.

The species is not found South of Tromsø. According to Jeffreys, it has been found by Torrell off Spitzbergen; it is kuown, besides, from Greenland and North America.

Bela pyramidalis, Strøm.

Pl. VIII, Fig. 25 (Operculum) Tab. X, Fig. 21 (Tænder).

Buccinum pyramidale, Strøm, Nov. act. Dan. III, Pag. 296, Fig. 22.
Defrancia Vahlii (Beck) Møll., op. c. Pag. 86.
Bela pyramidalis, G. O. Sars, op. c. Pag. 222, Pl. 16, Fig. 3 & 4.

De to hos os forekommende Varieteter af denne Art er af Sars fuldt tilfredsstillende illustreret, og noget nyt hertil kan jeg ikke tilføie.

Formen *semiplicata*, Sars, med et Spir, der er lige langt eller kortere end Mundaabningen, synes at være den almindeligste, og Formen *typica*, Sars, med et uddraget Spir længere end Mundaabningen er sjeldnere.

Vindingerne er vel afrundede og aldrig vinklede. De axiale Ribber, der er stærkt sigmabøiede, er vexlende i Antal fra 12 til 18 og Spiralstrieringen er hos gamle Exemplarer meget fin og tæt, medens den hos yngre er uregelmæssig i Styrke. Farven varierer fra brun violet til gul.

Operculum (Tab. VIII, Fig. 25) er ovalt.

Tænderne (Tab. X, Fig. 21, *a*, *b*) er knivformige med et middelmaadig langt Manubrium.

Forekomst: 262, 270, 323, Lofoten, Tromsø, Hammerfest og Reykjavik (Island) 10 til 223 Favne.

Bela pyramidalis, Strøm.

Pl. VIII, fig. 25 (operculum) Pl. X, fig. 21 (teeth).

Buccinum pyramidale, Strøm, Nov. oct. Dan. III, pag. 296, fig. 22.
Defrancia Vahlii (Beck) Møll. op. c. pag. 86.
Bela pyramidalis, G. O. Sars, op. c. pag. 222, Pl. XVI, fig. 3, 4.

The two varieties of this species which occur with us, are illustrated, by Sars, in a perfectly satisfactory manner, and I can add nothing new.

The variety *semiplicata*, Sars, with a spire of the same length, or shorter, than the aperture, appears to be the most frequent one, and *forma typica*, Sars, with an attenuated elongate spire, longer than the aperture, is more rare.

The whorls are broadly rounded and never angular. The axial ribs, which are strongly curved sigmoidally, are variable in number, from 12 to 18, and the spiral striation is, in mature specimens, very fine and close, whilst, in younger ones, it is irregular in strength. The colour varies from brown-violet to yellow.

Operculum, (Pl. VIII, fig. 25) is oval.

The *teeth* (Pl. X, fig. 21, *a*, *b*) are scalpriform, with a manubrium of average length.

Habitat: Stats. 262, 270, 323, Lofoten, Tromsø, Hammerfest, and Reykjavik (Iceland) in 10 to 223 fathoms.

Paa Dybderne mellem 147 og 223 Favne blev kun døde Exemplarer fundne.

Heller ikke denne Art er hos os funden søndenfor Polarcirkelen. Forøvrigt er den kjendt fra Spitzbergen, Novaja Semlja og Grønland. Hvorvidt vor Art er identisk med *Fusus pleurotomaria*, Couth.[1], *rufus Gould*[2], tør jeg ikke have nogen bestemt Mening om, da jeg ikke har havt gode amerikanske Exemplarer til Sammenligning, men at den grønlandske, *Defrancia Vahlii*, Møller, falder sammen med vor, har jeg overbevist mig om. Baade Jeffreys og Sars holder *B. pyramidalis* og *pleurotomaria* for synonyme og der er meget, som taler for dette; thi naar den første findes baade ved Island og Grønland, synes der at være al Sandsynlighed for at den ogsaa gaar længere syd paa den amerikanske Side. Goulds Afbildning af *Fusus rufus* (Inv. Mar. Fig. 192) ligner ogsaa meget vor Art.

De øvrige nordiske *Pleurotomidæ* agter jeg ikke her at gaa nærmere inde ind paa. Kun skal jeg nævne:

Defrancia amoena, G. O. Sars.

Tab. X, Fig. 22 (Tænderne).

Raphitoma amoena, G. O. Sars, Moll. reg. arc. Pag. 220, Pl. 17, Fig. 10.

Tænderne, Pl. X, Fig. 22, er sværdformige, næsten rette med et spadeformigt Manubrium. De ligne meget paa *Thesbia nana*, Lovén. Tandstrukturen har tidligere ikke været kjendt.

Forekomst: St. 192, 195, 223, 260, 261, 270, 273, 290 og 357 — fra 70 til 649 Favne.

Denne lille smukke Art synes at være meget udbredt overalt i det arctiske Hav.

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[1] Boston Juorn. Nat. Hist. 1838, Pag. 107, Pl. 1, Fig. 9.
[2] Invert. Mass. 1841, Pag. 290, Fig. 192.

At depths between 147 and 223 fathoms, only dead specimens were found.

Neither is this species found with us south of the Polar circle. It is known, however, from Spitzbergen, Nova Zembla, and Greenland. In how far this species is identical with *Fusus Pleurotomaria*, Couth[1], *rufus Gould*[2] I am not able to express any decided opinion, as I have had no good American specimens for comparison, but I have satisfied myself that the Greenland *Defrancia Vahlii*, Møller, coincides with it. Both Jeffreys and Sars, consider *B. pyramidalis* and *pleurotomaria* to be synonymous, and there is much to support this; because when the former is found both at Iceland and Greenland, there appears to be every probability that it occurs, also, further south on the American side. Goulds illustration of *Fusus rufus* (Inv. Mar. Fig. 192) also, much resembles this species.

The remaining Northern *Pleurotomidæ* I do not propose to discuss, here, but will only refer to

Defrancia amoena, G. O. Sars.

Pl. X, fig. 22 (the teeth).

Raphitoma amoena, G. O. Sars, „Moll. reg. arc." pag. 220, Pl. 17. fig. 10.

The *teeth*, Pl. X, fig. 22, are ensiform, almost straight, with a spade-formed manubrium. They much resemble those of *Thesbia nana*, Lovén. The dental structure has not previously been known.

Habitat: Stats. Nos. 192, 195, 223, 260, 261, 270, 273, 290 and 357. — Depth from 70 to 649 fathoms.

This small and beautiful species appears to be widely distributed all over the Arctic Ocean.

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[1] Boston Journ. Nat. Hist. 1838, pag. 107, Pl. I, fig. 9.
[2] Invert. Mass. 1841, pag. 290, fig. 192.

Cancellaria.

Admete viridula, Fabr.

Tab. VIII, Fig. 27—30.

Tritonium viridulum, Fabricius, Fauna Groenl. 1780, P. 402.
Cancellaria Couthouyi, Jay, Cat. 1839.
Admete crispa, Møll. Krøyers Tidsskr., Pag. 88.
Cancellaria viridula, Midd. „Beitr. Malaco. Ross.“ Pag. 110, Pl. IX, Fig. 13, 14 og Pl. X, Fig. 1—4.
Admete Middendorffiana, Dall, Proc. U. S. Nat. Mus. 1885, Pag. 524.

Middendorff og senere Prof. Leche[1] har henledet Opmærksomheden paa denne Arts mærkelige Variationsevne i de arctiske Have. Under Spitzsbergen forekommer ogsaa en Række Varieteter og deres Størrelse overgaar betydelig den, der opnaaes ved den norske Kyst.

Fig. 27 og 28 er en meget kortspiret Varietet, der snart har svagt ubviklede axiale Folde paa øverste Del af Hovedvindingen (Fig. 27), snart mangle disse fuldstændig (Fig. 28). Spiralstrieringen er ogsaa svag.

Denne Varietet holder jeg for at være Middendorffs var. III (l. c. Pl. IX, Fig. 13, 14).

Det er Leches var. *lævior* og Dalls *Admete Middendorffiana*.

Fig. 29, 30 er Mørchs var. *grandis* (Cat. Moll. Spitzb. Pag. 18). Denne opnaar en Størrelse af 18^{mm}.

Begge disse Varieteter fandtes i Adventbay (Spitsbergen) 20—40 Favne. Over det hele arctiske Hav er Arten almindelig udbredt ned til 200 Favne. Fra St. 192—649 Favne haves vistnok ogsaa et Exemplar, men dødt og jeg tvivler paa, at den hører dette Dyb til.

Prof. Verrill angiver *B. Couthouyi* som forekommende ned til en Dybde af 1255 Favne.

Admete contabulata, Friele.

Pl. VIII, Fig. 31, 32.

Admete contabulata, Friele, „Cat. Spitzb. Moll.“ Mall. Jahrb. 1879, Pag. 276.

Skallen hvid, med 5 raskt tiltagende stærkt angulære Vindinger, Spiret omtrent af Mundaabningens Længde, Suturen grund, Apex glat, stump og mamilleformig; Mundaabningen udvidet, nedad noget tilspidset, Columellen ret

[1] Nov. Sembl. & Jenissey Hafsmollusker Pag. 47.

Cancellaria.

Admete viridula, Fabr.

Pl. VIII, fig. 27—30.

Tritonium viridulum, Fabricius, Fauna Groenl. 1780, p. 402.
Cancellaria Couthouyi, Jay, Cat. 1839.
Admete crispa, Møll. Krøyer's Tidskr. pag. 88.
Cancellaria viridula, Midd. „Beitr. Malaco. Ross“ pag. 110, Pl. IX, fig. 13, 14 and Pl. X, fig. 1—4.
Admete Middendorffiana, Dall, Proc. U. S. Nat. Mus. 1885, pag. 524.

Middendorff and, subsequently, Prof. Leche[1] have called attention to the remarkable variations of this species in the Arctic Ocean. Off Spitzbergen, a series of varieties occurs, and their size considerably exceeds what is attained on the Norwegian coast.

Figs. 27 und 28 are a very short-spired variety, that, sometimes, has faintly developed axial folds on the upper part of the Body-whorl (fig. 27), and sometimes, is completely devoid of them (fig. 28). The spiral striation, also, is faint.

I consider this variety to be Middendorffs var. III (l. c. Pl. IX, fig. 13, 14).

It is Leches var. *lævior*, and Dalls *Admete Middendorffiana*.

Figs. 29, 30 shew Mørchs var. *grandis* (Cat. Moll. Spitzb. pag. 18) which attains a size of 18^{mm}.

Both of these varieties were found in Advent Bay (Spitzbergen), in 20—40 fathoms. The species is distributed, generally, over the Arctic seas, at a depth not exceeding 200 fathoms. From Station No. 192 in 649 fathoms we have, indeed, one specimen, but a dead one, and I doubt whether it pertains to that depth.

Prof. Verrill states *B. Couthouyi* as occurring down to a depth of 1255 fathoms.

Admete contabulata, Friele.

Pl. VIII, figs. 31, 32.

Admete contabulata, Friele, „Cat. Spitzb. Moll.“ Mall. Jahrb. 1879, pag. 276.

The shell white, with 5 rapidly increasing, strongly angular, whorls; the spire of about the same length as the aperture; the suture shallow; apex smooth, obtuse, and mammiform; the aperture dilated, somewhat pointed

[1] Nov. Sembl. & Jenissey Hafsmollusker pag. 47.

med 2 svage Folde. Canalen kort. Sculpturen bestaar af talrige hævede Spirallinier, der naar til den rundt Vindingerne gaaende Kjøl, ovenpaa denne er der enten svage Antydninger til Spiralsculptur, eller er denne forsvunden; paa 3die og 4de Vinding er skjævtliggende, kraftige axiale Folde, der forsvinde imod sidste Halvdel af Hovedvindingen.

Størrelse: 8mm Axiallængde 4mm Diameter.

Forevomst: 124, 192, 328 — fra 146 til 649 Favne.

Det er en fra *Admete viridula* let adskillelig Form ved de stærkt vinklede Vindinger, de skjæve axiale Ribber, der rundt Kjølen næsten er knudeformige og den glatte mamilleformige Apex.

below. The column straight, with two faint folds; the canal short. The sculpture consists of numerous, raised, spiral cinguli, which extend to the carina. Between it and the suture there are, either, faint indications of a spiral sculpture, or it has altogether disappeared. On the 3rd and 4th volutions, there are slanting, strong, axial folds, which disappear towards the ultimate half-portion of the Body whorl.

Size: Axial length, 8mm. Diameter, 4mm.

Habitat: Stats. Nos. 124, 192, 328. Depth, 146 to 649 fathoms.

This form is easily distinguishable from *Admete viridula*, by its strongly angular whorls, its slanting axial ribs which, round the carina, are almost nodiform, and by its smooth mammiform apex.

Admete inflata, Friele.

Tab. VIII, Fig. 33.

Trichitropis inflata, Friele, „Cat. d. Spitsbrg. Moll.“ 1879, Pag. 275.

Trichitropis inflata; Verrill, 2d Cat. Moll. 1884, Pag. 178.

Skallen hvid, semitransparent, tynd, oval, med 5 tumide, raskt tiltagende Vindinger, hvoraf den sidste er $^{2}/_{3}$ Dele af Skallens Længde, Suturen tydelig og ofte dyb; Mundaabningen halvmaaneformig, noget udvidet nedad; ydre Læbe skarp, den indre udbredt og tilbagekastet over Columellen; denne er ret med en eller to svage Folde; Umbilicus delvis dækket, men dog tydelig og dyb. Sculpturen bestaar af fine tætte Spirallinier, der snart viser sig som indskaarne Striæ, snart som hævede fine Cinguli, samt meget svage, bøiede Vækststriber, der især er synlig henimod Mundaabningen.

Størrelse: 8mm Axiallængde 4.5mm Diameter.

Forekomst: St. 192, 312, 323 — fra 223 til 658 Favne.

I „Cat. der Spitzberg. Moll.“ er denne Art af mig opført under *Trichitropis*; den bør henføres til *Admete*, hvilket ogsaa Verrill i sin „2d Catalogue of Moll.“ gjør opmærksom paa.

Den er af Verrill angivet fra 1290 Favne udenfor New Englands Kyster (40° 16′ 50″ N. Br., 67° 5′ 15″ V. L.).

Admete inflata, Friele.

Pl. VIII, fig. 33.

Trichitropis inflata, Friele, „Cat. d. Spitzbrg. Moll.“ 1879, pag. 275.

Trichitropis inflata, Verrill, 2nd Cat. Moll. 1884, pag. 178.

The shell white, semi-transparent, thin, oval, with 5 tumid, rapidly increasing whorls, the ultimate one of which is two-thirds of the length of the shell. The suture distinct, and frequently deep. The aperture crescent-shaped, somewhat expanded below; the exterior lip sharp, the interior lip spread out and doubled back over the column. The last named straight, with one or two faint folds. The umbilicus partly covered but, still, distinct and deep. The sculpture consists of fine, close, spiral lines, which sometimes appear as impressed striæ, sometimes as elevated fine cinguli, and of very faint, curved, lines of growth which are especially visible in the proximity of the aperture.

Size. Axial length, 8mm. Diameter, 4.5mm.

Habitat: Stats. Nos. 192, 312, 323. Depth, 223 to 668 Fathoms.

In „Cat. der Spitzberg. Moll.“ I have placed this species under *Trichitropis*: it ought to be assigned to *Admete*, as Verrill, also, has pointed out in his „2nd Catalogue of Moll.“

It is stated by Verrill as pertaining to the New England coast, in 1290 fathoms (40° 16′ 50″ N. L., 67° 5′ 15″ W. L.).

Nathica bathybii, Fr.

Pl. XI, Fig. 1, 2.

Natica bathybii, Friele, „Cat. Spitsb. Moll.“ 1879, Pag. 272.

Skallen solid, hvid, globøs med 5 tumide Vindinger, Spiret svagt hævet og afrundet, Mundaabningen oval, $^2/_3$ Del til $^3/_4$ af Skallens Længde, Callo tyndt udbredt og Columellen tilbagekastet saaledes, at Umilicus for største Delen er dækket og der viser sig kun en dyb, men smal Umbilicalsplit. Skallen er glat og blot svage og uregelmæssige Vækststriber er synlige. Af Spiralsculptur viser der sig paa yngre Exemplarer nogle svage Spor til Striæ, der dog kun er synlig i en bestemt Belysning.

Operculum hvidt, kalkagtig, middelmaadig tykt med svage, skyggeagtige Vækststriber.

Størrelse: 15mm Axiallængde, 13mm Diam., Mundaabningen 10mm.

Var. oblonga.

Tab. XI, Fig. 2.

Spiret mere hævet.

Forekomst: St. 51, 240, 251, 303, 312, 353 fra 650 til 1333 Favne.

Baade den typiske Form og Varieteten *oblonga* forekommer imellem hinanden.

Denne Art har stor Lighed med *N. affinis*, Gml. og synes i Skalform at variere omtrent indenfor de samme Grændser som denne, idet Formen *occlusa*, Wood, er en tilsvarende Varietet af *affinis* som *oblonga* af *bathybii*. Fra *N. affinis* vil dog vor Art let adskille sig ved den tydelige Navlesplit, der ligner den hos *Lunatia groenlandica* Møll.

Tænderne ligner *N. affinis*.

Velutina Schneideri, n. sp.

Tab. XI, Fig. 3, 4.

Skallen oval, tynd, mørkebrun; Vindingerne $2^1/_2$ til 3 hvoraf sidste udgjør den væsentligste Del af Skallen, Spiret hæver sig kun ubetydelig, Mundaabningen vid oval; Sculpturen bestaar af tætte Vækststriber og svage, utydelige, noget fjernede og ubetydelig hævede Spiralribber; hvor Epidermis er fjernet, fremkommer et fint chagrineret Ydre over Skallen, Epidermis hudagtig, brun og tæt rynket.

Størrelse: 10mm Axial, 9mm Diam.

Forekomst: Tromsø 20 Favne.

Nathica bathybii, Fr.

Pl. XI, figs. 1, 2.

Natica bathybii, Friele, Cat. Spitzb. Moll. 1879, pag. 272.

The shell solid, white, globular, with 5 tumid whorls; the spire slightly elevated, and rounded; the aperture oval, measuring two-thirds to three-fourths of the length of the shell; the callo thinly spread out, and the column doubled back so that the umbilicus is, for the most part, covered, and there appears only a deep, but narrow, umbilical split. The shell is smooth, and only faint irregular lines of growth are visible. In young specimens, the spiral sculpture appears in a few faint traces of striæ, which are, however, only visible in a certain light.

Operculum, white, calcareous, moderately thick, with faint, shadowy, lines of growth.

Size: Axial length, 15mm. Diam., 13mm. Aperture, 10mm.

Var. oblonga.

Pl. XI, fig. 2.

The spiral considerably elevated.

Habitat: Stats. Nos. 51, 240, 251, 303, 312, 353. Depth, 650 to 1333 fathoms.

Both, the typical form and the variety *oblonga*, occur together.

This species has a great resemblance to *N. affinis*, Gml. and its shell-form appears to differ, within about similar limits to that, because the form *occlusa*, Wood, is a corresponding variety of *affinis*, just as *oblonga* is of *bathybii*. Our species is, however, distinguishable from *N. affinis* by its distinct umbilical split, which resembles that of *Lunatia groenlandica*, Moll.

The *teeth* resemble those of *N. affinis*.

Velutina Schneideri, n. sp.

Pl. XI, fig. 3, 4.

The shell oval, thin, dark-brown. $2^1/_2$ to 3 whorls, the ultimate one of which forms the largest part of the shell. The spire is only slightly elevated. The aperture wide, ovate. The sculpture consists of close-set lines of growth, and of faint, indistinct, somewhat separated, and only slightly elevated, spiral ribs; where the epidermis is removed, a fine shagreen-like exterior appears on the shell: the epidermis coriaceous, brown, and closely puckered.

Size: Axial length, 10mm. Diameter, 9mm.

Habitat: Tromsø. Depth, 20 fathoms.

Denne for Norges Kystfauna nye Art adskiller sig fra *Velutina lævigata,* Penn. ved sin mørkere Farve, der i Skallens Indre ofte spiller over i det violette og ved den væsentlig afvigende Sculptur. Den synes at være temmelig sjelden.

This species — a new one in the fauna of Norway — is distinguishable from *Velutina lævigata,* Penn. by its darker colour which, in the interior of the shell, frequently merges into violet, and by its materially divergent sculpture. It appears to occur rather rarely.

Rissoa Verrilli, n. sp.

Tab. XI, Fig. 5, *a.*

Skallen lang oval, hvid, solid, Vindingerne 5, convexe, Apex stump, glat, Suturen dyb, Mundaabningen rund oval; Sculpturen bestaar af omtrent 20 stærkt fremtrædende axiale Ribber og en microscopisk fin og tæt Spiralstriering. Der er ingen Navle, men kun en fin Navlesplit;* den ydre Læbe er fortykket.

Størrelse: 3mm Axiall. 1½mm Diam.

Forekomst: St. 192—649 Favne.

Den eiendommelige fine Spiralsculptur, der i Fig. 5 *a* er gjengivet, gjør denne Art let gjenkjendelig.

Den forekom kun paa en eneste Station, men var her temmelig talrig, dog alle døde Exemplarer.

Rissoa Verrilli, n. sp.

Pl. XI, fig. 5, *a.*

The shell ovo-elongate, white, solid; 5 convex whorls; apex obtuse, smooth: the suture deep; the aperture subcircular. The sculpture consists of, about, 20 strongly prominent axial ribs, and a microscopically minute and close spiral striation. There is no umbilicus but only a minute umbilical split. The outer lip is thickened.

Size: Axial length, 3mm, Diam. 1½mm.

Habitat: Stat. No. 192. Depth, 649 fathoms.

The peculiar fine spiral sculpture, which is illustrated in fig. 5, *a,* causes this species to be readily distinguishable.

It occurred at only one station, but it was, there, pretty abundant; all the specimens were, however, dead.

Rissoa (Alvania) Jan Mayeni, Fr.

Tab. XI, Fig. 6, 7.

Rissoa Jan Mayeni, Friele, Nyt. Mag. 1878, Pag. 224, Pl. 1, Fig. 4 *a, b.*
R. sibirica, Leche, Sv. Vet. Akad. Handl. Bd. 16 („Hafsmollusker") Pag. 38, Tab. 1, Fig. 10.

Skallen oval conisk, solid, brun; Vindingerne 5 tumide, vinklede rundt de to sidste eller kun sidste Vinding, Suturen dyb og ofte furelignende; Mundaabningen rund oval, noget udvidet nedad og noget vinklet hvor den ydre Læbe støder sammen med Columellen; Columellen lidet bøiet, der er ingen Navle, men kun en mere eller mindre dyb Navlesplit. Sculpturen bestaar af 5 til 8 stærkt fremtrædende axiale Ribber, hvilke rundt de sidste Vindingers Periferi er knudformige, samt 8 til 10 Spiralfurer. De axiale Ribber gaa sjelden længere end halvt ned paa Hovedvindingen og imellem forsvinde de fuldstændig ud mod Mundaabningen.

Størrelse: 5mm Axiall., 2mm Diam.

Forekomst: 223, 224, 225, 267, 270, 273, 326, 336, 357 fra 70 til 197 Favne.

Rissoa (Alvania) Jan Mayeni, Fr.

Pl. XI, figs. 6, 7.

Rissoa Jan Mayeni, Friele, Nyt. Mag. 1878, pag. 224, Pl. I, fig. 4 *a, b.*
R. sibirica, Leche, Sv. Vet. Akad. Handl. Bd. 16 („Hafsmollusker") pag. 38, Pl. I, fig. 10.

The shell oval-coniform, solid, brown; 5 tumid whorls, angulated round the penultimate and ultimate, or ultimate whorl only; the suture deep and frequently groove-like. The aperture subcircular, somewhat dilated below, and somewhat angulated at the point where the outer lip unites with the column; the column inconsiderably curved. No umbilicus but, only, a more or less deep umbilical fissure. The sculpture consists of 5 to 8 strongly prominent axial ribs which are, round the periphery of the ultimate whorls, nodiform, and also of 8 to 10 spiral grooves.. The axial ribs seldom proceed further than half down the Body whorl, and sometimes completely disappear towards the aperture.

Size: Axial length, 5mm, Diam. 2mm.

Habitat: Stats. Nos. 223, 224, 225, 267, 270, 273, 326, 336, 357. Depth, 70 to 197 fathoms.

Over den hele arktiske Zone synes denne Art at være talrig udbredt i de middelmaadige Dyb. Prof. Leche angiver den fra det Kariske Hav[1].

Hvorvidt *Cingula Jan Mayeni*, Verrill er vor Art, betvivler jeg. Prof. Verrill har været saa venlig at sende mig Exemplarer af den amerikanske Form, men disse adskiller sig fra vor ved en paafaldende grovere Sculptur. Spiralribberne er saaledes kun 3 til 4 og af betydelig Styrke, hvorved Skallen faar Udseendet af at være 3—4 carineret. Ved at sammenligne Verrills Tegning (Cat. Mar. Moll. 1882, Pl. XLII, Fig. 8) med vor, vil denne Afvigelse være iøinefaldende. For at adskille disse to Former vil jeg derfor foreslaa *Rissoa americana* for den amerikanske Form.

This species appears to be abundantly distributed over the whole arctic zone, in moderate depths. Prof. Leche states it as pertaining to the Kara sea[1].

I have some doubt whether *Cingula Jan Mayeni*, Verrill, is our species. Prof. Verrill has kindly sent me specimens of the American shell, but it is distinguishable from ours by a strikingly coarser sculpture. The spiral ribs are, for instance, only 3 to 4 in number and of considerable strength, owing to which fact the shell acquires the appearance of being triply to quadruply carinated. On comparison of Verrills illustration (Cat. Mar. Moll. 1882, Pl. XLII, fig. 8) with ours, this divergence becomes immediately apparent. In order to distinguish these two forms I would, therefore, propose as an appellation for the American form, *Rissoa americana*.

Rissoa (Cingula) islandica, n. sp.

Tab. XI, Fig. 8, 9.

Skallen gjennemsigtig hvid, svag glindsende, cylindrisk conisk, Vindingerne 5 svagt convexe, Suturen dyb; Mundaabningen omtrent $^3/_7$ Del af Skallens Længde, rund oval, noget udvidet nedad og noget skjæv; ydre Læbe noget fortykket, den indre vel udviklet og sammenhængende; der er en tydelig Umbilicalsplit. Sculpturen bestaar af yderst fine, næsten microscopiske Spiralstriæ og svage, men tætte Vækststriber; Apex er stump, glat og glindsende.

Størrelse: $2^1/_2$ mm Axiall., $1^1/_2$ mm Diam.
Forekomst: St. 48—299 Favne. 1 levende Expl.

Dr. Jeffreys antog vor Art for muligens at være en Dybvandsvarietet af *Rissoa arenaria*, men denne Anskuelse kan jeg ikke dele, da den forekommer mig altfor afvigende baade i Form og Sculptur. *Cingula leptalea*, Verr., synes at staa den meget nær, men Mundaabningens Form er afvigende.

Rissoa (Cingula) islandica, n. sp.

Pl. XI, figs. 8, 9.

The shell translucently white, faintly lustrous, cylindric-conical; 5 faintly convex whorls; the suture deep; the aperture measuring about three-sevenths of the length of the shell, subcircular, somewhat dilated outwards and a little oblique; the outer lip somewhat thickened; the inner lip well developed and continuous: there is a distinct umbilical fissure. The sculpture consists of extremely fine, almost microscopical, spiral striæ, and of faint, but close lines, of growth. Apex, obtuse, smooth and lustrous.

Size: Axial length, 2.5 mm, Diam. 1.5 mm.

Habitat: Stat. No. 48. Depth, 299 fathoms. One living specimen.

Dr. Jeffreys considered our species to be, probably, a deep-water variety of *Rissoa arenaria*, but I cannot share that opinion, as it appears to me to be too divergent both in form and sculpture. *Cingula leptalea*, Verr. appears to be related to it, but the form of the aperture differs.

Rissoa (Setia) Griegi, Fr.

Tab. XI, Fig. 10.

Rissoa Griegi, Friele, Jahrb. Mal. Gesell. 1879, Pg. 274.

Skallen rund oval, næsten globos, gulagtig, Vindingerne 4 tumide, raskt tiltagende, Spiret kort, Suturen dyb;

Rissoa (Setia) Griegi, Fr.

Pl. XI, Fig. 10.

Rissoa Griegi, Friele, Jahrb. Mal. Gesell, 1879, pag. 274.

The shell subcircular, almost globular, yellowish; 4 tumid, rapidly increasing, whorls; the spire short; Suture

[1] Herzenstein (op. c. Pag. 682) angiver den fra det hvide Hav.

[1] Herzenstein (Op. c. pag. 682) states that it pertains to the White Sea.

Mundaabningen er omtrent halve Skallens Længde, rund oval, noget angulær i øvre Ende; ydre Læbe skarp; Umbilicus liden, men dyb. Sculpturen bestaar af tætte, overordentlig fine Spiralstriæ; Apex er glat og nedtryt.

Størrelse: 1.5mm Axiall., 1.2mm Diam.

Forekomst: St. 353—1333 Favne. Et levende Exemplar.

Hvorvidt man her har et fuldt udviklet Individ for sig, eller et Ungdomsstadie, vil være vanskeligt at afgjøre.

Samtidig med *Rissoa Griegi* beskrev jeg i „Mal. Jahrbücher„ 1879 *Rissoa semipellucida* fra samme Station. Ved nærmere Sammenligninger er jeg imidlertid kommen til det Resultat, at denne er en Dybvandsform af *Rissoa turgida*, Jeffreys og den maa saaledes udgaa som selvstændig Art.

deep; the aperture measures about half the length of the shell, subcircular, somewhat angular in the upper extremity; the outer lip sharp; umbilicus small, but deep. The sculpture consists of close, extremely minute, spiral striæ; apex smooth and flattened.

Size. Axial length, 1.5mm, Diam., 1.2mm.

Habitat: Stat. No. 353. Depth 1333 fathoms. One living specimen.

Whether we have before us, here, a mature, or, only, an immature stage, is difficult to determine.

Along with *Rissoa Griegi* I described, in „Mal. Jahrbücher" 1879, *Rissoa semipellucida*, obtained at the same station. Upon further comparative examination I have, however, arrived at the opinion that the latter is a deep-water form of *Rissoa turgida*, Jeffreys, and it must therefore be struck out as an independent species.

Odostomia sublustris, n. sp.

Tab. XI, Fig. 11, *a*.

Skallen conisk oval, hvid glindsende, Vindingerne 5 convexe, jevnt tiltagende, Suturen dyb; Apex glat, stump og Nucleus nedtrykt og noget tilsidebøiet; Mundaabningen oval, afrundet vinklet i nedre Ende; Columellen er ubetydelig bøiet og der er en svag Antydning til Fold; Umbilicus liden, men tydelig. Sculpturen bestaar af 16 til 18 grove Axialribber; 1ste Vinding er glat.

Størrelse: 2.5mm Axiall., 1.2mm Diam.

Forekomst: St. 124, 192, 251 fra 350 til 649 Favne.

Odostomia sublustris, n. sp.

Pl. XI, fig. 11, *a*.

The shell oval, coniform, lustrous white, 5 convex, regularly increasing, whorls; suture deep; apex smooth, obtuse, with nucleus depressed and somewhat laterally twisted; the aperture oval, rounded angularly in the lower extremity; the column is only slightly curved, and there is a faint indication of a fold; umbilicus small, but distinct. The sculpture consists of 16 to 18 coarse axial ribs. The first whorl is smooth.

Size. Axial length, 2.5mm, Diam., 1.2mm.

Habitat: Stats. Nos. 124, 192, 251. Depth, 350 to 649 fathoms.

Odostomia Normani, n. sp.

Tab. XI, Fig. 12.

Skallen aflang, noget tynd, hvid opak, glindsende; Vindingerne $4^1/_2$ svagt convexe og raskt tiltagende, sidste Vinding er omtrent halve Skallens Længde, Apex stump med nedtrykt Nucleus (ligner foregaaende Arts), Suturen grund; Mundaabningen piriform, tilspidset opad; Columellen næsten ret med en meget svag, foldlignende Tand øverst, Umbilicus meget liden; Sculptur ingen; den er fuldstændig glat, kun enkelte Exemplarer vise Tegn til mikroscopisk fine Vækststriber.

Størrelse: 2mm Axiall., 1mm Diam.

Odostomia Normani, n. sp.

Pl. XI, fig. 12.

Shell oblong, somewhat thin, opaque white, lustrous; $4^1/_2$ faintly convex, and rapidly increasing, whorls; the ultimate whorl is about half of the length of the shell. Apex obtuse, with depressed nucleus (similar to that of the preceding species); suture shallow; aperture piriform, acuminated upwards; the column almost straight, with a very faint fold-like tooth at the upper extremity; umbilicus very small. It is perfectly smooth; only occasional specimens shew traces of, microscopically minute, lines of growth.

Size. Axial length, 2mm, Diam., 1mm.

For en 14—15 Aar siden har jeg fundet denne, som jeg tror nye Art for vor Fauna ved Bergen. Under Expeditionen med „Vøringen" forekom den ved Sognefjordens Munding og ligeledes har jeg taget den ved Florø. Dens bathymetriske Forekomst er imellem 30 og 50 Favne. Dens nærmeste Slægtning maa antagelig være *O. diaphana*, Jeff. men denne har en meget længere sidste Vinding, ligesom den er mere hyalin.

Jeg har dedicert denne Art til min Ven Mr. A. M. Norman.

About 14 or 15 years ago I found this — I believe, new species in our Fauna — near Bergen. On the expedition with the „Vøringen," it occurred at the mouth of the Sognefjord, and I have, also, found it near Florø. Its bathymetrical occurrence is between 30 and 50 fathoms. Its nearest relative is, presumably, *O. diaphana*, Jeff., but that has a much longer ultimate whorl, and it is also more hyaline.

I have dedicated this species to my friend the Revd. A. M. Norman.

Eulima Lauræ, n. sp.

Tab. XI, Fig. 13, 14, *a*.

Skallen cylindrisk, hvid, glindsende, solid, fuldstændig glat; Vindingerne 8 svagt tiltagende og noget convexe, Suturen grund, men tydelig; Apex afrundet stump; Mundaabningen er omtrent $^1/_4$ Del af Skallen, piriform; den ydre Læbe flexuos og danner en bred Sinus i øvre Ende, den indre Læbe noget fortykket; Columellen bøiet og tilbagekastet, hvorved Umbilicus fuldstændig lukkes.

Størrelse: 4.2^{mm} Axiall., 1^{mm} Diam.

Forekomst: St. 192—649 Favne, 3 Exempl.

Denne lille vakre Art ligner noget paa smaa Exemplarer af *Eulimella ventricosa*, Forb.

Eulima Lauræ, n. sp.

Pl. XI, figs. 13, 14, *a*.

The shell cylindrical, white, lustrous, solid, perfectly smooth; 8 slowly increasing, and somewhat convex, whorls; the suture shallow, but distinct; Apex obtusely rounded; the aperture measures about one-fourth part of the length of the shell, piriform; the outer lip flexuous, and forms a broad sinus in the upper extremity; the inner lip somewhat thickened; the column bent and doubled back, causing the umbilicus to be perfectly closed.

Size. Axial length, 4.2^{mm}, Diam., 1^{mm}.

Habitat: Stat. No. 192. Depth, 649 fathoms. Three specimens.

This small and beautiful species somewhat resembles small specimens of *Eulimella ventricosa*, Forb.

Solariella lævis, n. sp.

Tab. XII, Fig. 4, 5, 6.

Gen. *Solariella*, Wood 1842.
„ *Machæroplax*, Friele 1876.

Skallen tynd, lys kjødfarvet med et svagt Anstrøg af perlemorglindsende, bred konisk; Vindingerne 5 tumide, den sidste er dog ofte noget fladtrykt paa Undersiden, hvorved fremkommer en svag angulær Kant nedenfor Periferien, Spiret kort, men tilspidset, Suturen dyb; Mundaabningen skjæv oval, ydre Læbe skarp; Umbilicus noget vid og dyb. Sculpturen viser snart kun svage Vækststriber, forøvrigt fuldstændig glat, snart er der utydelige Antydninger til Spiralfurer.

Størrelse: 6^{mm} Axiall., 6.5^{mm} Diam.

Forekomst: St. 124 og 173 *b* — fra 300 til 350 Favne.

Solariella lævis, n. sp.

Pl. XII, figs. 4, 5, 6.

Gen. *Solariella*, Wood 1842.
„ *Machæroplax*, Friele 1876.

The shell thin, light flesh-coloured, having a faint tinge of mother-of-pearl lustre, broad coniform; 5 tumid whorls, of which, the ultimate one is frequently somewhat flattened on the lower surface, forming, thus, a faint angular margin below the periphery; the spire short, but pointed; suture deep; the aperture oblique oval; the outer lip sharp; umbilicus somewhat wide, and deep. The sculpture sometimes shows only faint lines of growth, and is, otherwise, perfectly smooth, sometimes there are indistinct indications of spiral grooves.

Size. Axial length, 6^{mm}, Diam. 6.5^{mm}.

Habitat: Stats., 124 and 173, *b*. Depth, 300 to 350 fathoms.

Arterne inden denne Slægt synes at være i høi Grad polymorfe og om end denne smukke glatte Form er saa høist ulige alle de øvrige kjendte af Slægten, er jeg dog ikke sikker paa, at der vil vise sig Overgange til *Solariella obscurus*, Couth. De paa et Par Exemplarer af *S. lævis* forekommende Spor af Spiralsculptur synes at antyde dette. Typen for *Solariella*, Wood er *S. maculata*, Wood[1] og denne er ifølge Jeffreys[2] *Trochus cinctus*, Philippi = *Machæroplax amabilis* (Jeff.) Friele[3] = *Machæroplax affinis* (Jeff.) Friele[3]. Hvis dette er correct, hvilket jeg ikke har havt Anledning at forvisse mig om, saa maa *Machæroplax* vige Plads for *Solariella*, uagtet Wood selv senere i Crag Moll. Pag. 135 inddrager Slægten under *Margarita*. Jeffreys feiler imidlertid, naar han henfører *Margarita cinerea*, Couth og *Margarita groenlandica*, Chm. under *Machæroplax*.[4]

The species included in this genus appear to be, in a very great degree, polymorphous, and although this beautiful, smooth, form is so very unlike all the others of the genus known, yet, I am not certain that transitions to *Solariella obscurus*, Couth, will be traceable. The traces of spiral sculpture appearing on a couple of specimens of *S. lævis* would appear to indicate this. The type for *Solariella*, Wood, is *S. maculata*, Wood[1] and that is according to Jeffreys[2] *Trochus cinctus*, Philippi = *Machæroplax amabilis* (Jeff.) Friele[3] = *Machæroplax affinis* (Jeff.) Friele[3]. If that is the case, but of which I have had no opportunity of satisfying myself, *Machæroplax* must give way for *Solariella*, although Wood himself, subsequently, in Crag Moll. (p. 135), includes the genus under *Margarita*. Jeffreys errs, however, when he assigns *Margarita cinerea*, Couth. and *Margarita groenlandica*, Chm. to *Machæroplax*[4].

Margarita umbilicalis, Br. & Sowb.

Tab. XI, Fig. 22, 23.

M. umbilicalis, Brod. & Sowb. Zool. Journ. IV, Pg. 371.
Trochus umbilicalis, Phil. Conch. Cab. Martini & Chm. af Küster, Pag. 245, Tab. 37, Fig. 2.

Som Regel er *M. umbilicalis* mere fladtrykt end *M. groenlandica*, Chm. Sculpturen er snart glat paa Oversiden af Skallen, snart forsynet med nogle faa, ofte parvis optrædende Spiralstriæ og paa Undersiden tæt, fint spiralstrieret.

Størrelse: Mine største Exemplarer maaler 10mm Axiall. og 16mm Diam.

Radula viser ingen Afvigelse fra *M. groenlandica*.

Forekomst: Den forekom talrig paa omkring 20 Favne Magdalenebay (Spitzbergen).

Margarita umbilicalis, Br. & Sowb.

Pl. XI, figs. 22, 23.

M. umbilicalis, Brod. & Sowb., Zool. Journ. IV, pag. 371.
Trochus umbilicalis, Phil.. Conch. Cab. Martini & Chm. by Küster, pag. 245, Pl. XXXVII, fig. 2.

As a rule, *M. umbilicalis* is more flattened than *M. groenlandica*, Chm. The sculpture is sometimes smooth on the upper surface of the shell, sometimes it is furnished with only a few spiral striæ appearing, frequently, in pairs; and on the lower surface it is compactly and minutely spirally striated.

Size. My largest specimen measures: Axial length, 10mm, Diam. 16mm.

The *Radula* does not differ from that of *M. groenlandica*.

Habitat: It occurred abundantly in Magdalene Bay (Spitzbergen); Depth, 20 fathoms.

Margarita striata, Br. & Sowb.[5]

Pl. XII, Fig. 1.

M. striata, Brod. & Sowb. Beechys Voy. Pag. 143, Pl. 34, Fig. 11.

Margarita striata, Br. & Sowb.[5]

Pl. XII, fig. 1.

M. striata, Brod. & Sowb., Beechys Voy. pag. 143, Pl. XXXIV, fig. 11.

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[1] Ann. & Mag. Vol. IX 1842, Pag. 531, Pl. 5, Fig. 7, 10.
[2] Moll. „Lightning & Porcupine Exped.“ Part VI 1883, Pg. 97.
[3] Tungebevæbng. hos de norske Rhipidoglosa 1876, Pag. 313.
[4] Jeffreys l. c. Pag. 96.
[5] Hvis *M. striata*, Br. & Sowb. ikke kan beholde sit specifike Navn, da der allerede er en *Trochus striatus*, Lin. maa *M. polaris*, Phil. rykke op istedenfor, men jeg tror ikke, at denne Forandring er nødvendig, thi man resikerer neppe Misforstaaelse.

[1] Ann. & Mag. Vol. IX 1842, pag. 531, Pl. V, fig. 7, 10.
[2] Moll. „Lightning“ & „Porcupine“ Exped. Part VI 1883, pag. 97.
[3] Tungebevæbng. hos de Norske Rhipidoglosa 1876, pag. 313.
[4] Jeffreys Op. c. pag. 96.
[5] If *M. striata*, Br. & Sow. can not retain its specific designation owing to there being a *Trochus striatus*, Lin. already, then *M. polaris*, Phil. must be substituted, but I do not think this change is necessary as there is scarcely room for misunderstanding.

Trochus polaris (Beck) Phil. Conch. Cab. Mart & Chm., Küster, Pag. 249, Tab. 37, Fig. 9.
Margarita sordida, Hanck. Ann. & Mag. XVIII 1846, Pag. 324.

Dr. Jeffreys og flere andre Forfattere vil ikke anerkjende denne Form for andet end en Varietet af *M. cinerea*, Couthouy. Men vil man være stræng i Artsbegrebet, saa vil neppe foregaaende være mere berettiget at hæves til Art end denne; begge holder jeg for eiendommelige arctiske Formudviklinger, der som saadanne har sin Berettigelse at benævnes med Artsnavn.

M. striata adskiller sig fra *M. cinerea* ved mere afrundede og ikke saa stærkt kjølede Vindinger; idet Spiralribberne ikke er saa kraftig fremtrædende og den axiale Sculptur hos *M. striata* bestaar kun af tætte, uregelmæssige Vækststriber. Hos *M. cinerea* er paa Spirets øvre Vindinger en gitret Sculptur, men denne savnes hos nærværende Art. Tandstrukturen er hos begge ens.

Størrelse: Mit største Exempl. maaler 13.5^{mm} Axiallængde og 18^{mm} Diam.

Forekomst: Magdalenebay (Spitsbergen) 60 Favne temmelig hyppig.

Hvorvidt *M. cinerea* var. *grandis*, Mørch, er nærværende Art, kan jeg ikke bestemt udtale mig om, men den af Sars i „Moll. reg. arc." Tab. 24, Fig. 4 afbildede *M. cinerea* var. *striata* er ikke *M. striata*, Brod. & Sowb.

M. striata var. margaritifera, nob.

Tab. XII, Fig. 2—3.

Skallen bred conisk, temmelig tynd, stærkt perlemorglindsende, Vindingerne 5, forbundne med en grund Sutur. Skulpturen bestaar af 4 til 5 vinklede Spiralribber paa sidste og 2 til 3 paa Spirets Vindinger; Apex er glat; paa Undersiden af Skallen, der er temmelig fladtrykt, er tætte Spiralstriæ; forøvrigt er Skallen glat, kun ud mod Mundaabningen er nogle Vækststriber. Umbilicus trang.

Størrelse: 5.5^{mm} Axiall. 5.5^{mm} Diam.
Forekomst: St. 124. 350 Favne. 2 levende Exempl.

Dette er den smukkeste Snekke i de arctiske Have; den har en Glands som den pragtfuldeste Perle. Umbilicus er paafaldende trangere end hos Typeformen.

Radula viser ingen Afvigelse fra *M. striata* fra grundere Vand.

Trochus polaris (Beck) Phil. Conch. Cab. Mart. & Chm. Küster, pag. 249, Pl. XXXVII, fig. 9.
Margarita sordida, Hanck. Ann. & Mag. XVIII, 1846, pag. 324.

Dr. Jeffreys, and several other Authors, will not recognise this form as anything else than a variety of *M. cinerea*, Couthouy. But, if we are strict in specific definition, the preceding species will scarcely be more entitled to be elevated to specific rank than this one. I consider both, however, to be peculiar Arctic developments of form and, as such, to be deserving of specific designations.

M. striata is distinguished from *M. cinerea*, by more rounded and not so strongly carinated whorls; whilst the spiral ribs are not so strongly prominent, the axial sculpture in *M. striata*, consists, only, of compact irregular lines of growth. In *M. cinerea*, the upper whorls of the spire, have a cancellated sculpture, but this is absent in the present species. The dental structure is alike in both.

Size. My largest specimen measures: Axial length, 13.5^{mm}, Diam., 18^{mm}.

Habitat: Magdalene Bay (Spitzbergen). Depth, 60 fathoms. Occurrence frequent.

Whether *M. cinerea*, var. *grandis*, Mørck, is identical with the present species I am unable to definitely say, but the *M. cinerea* var. *striata* illustrated by Sars, in „Moll. reg. Arc." Pl. XXIV, fig. 4, is not *M. striata*, Brod. & Sowb.

M. striata var. margaritifera, nob.

Pl. XII, figs. 2, 3.

The shell broad coniform, rather thin, with a strong mother-of-pearl lustre; 5 whorls, connected by a shallow suture. The sculpture consists of 4 to 5 angular spiral ribs on the ultimate whorl, and 2 to 3 whorls on the spire; apex smooth; on the lower surface of the shell, which is rather flattened, close spiral striæ occur; the shell, otherwise, is smooth, except that towards the aperture there are some faint lines of growth; umbilicus narrow.

Size. Axial length, 5.5^{mm}, Diam. 5.5^{mm}.

Habitat: Stat. No. 124. Depth, 350 fathoms. Two living specimens.

This is the most beautiful shell found in the Arctic Ocean. It has a lustre equal to the most brilliant pearl. The umbilicus is strikingly narrower than in the typical form.

The radula shows no divergence from that of *M. striata* from shallow depths.

Cyclostrema Petterseni, Fr.

Tab. XI, figs. 15, 16.

C. Petterseni, Friele, „Prelim. Rep. Moll." Nyt Mag. XXIII, 1877, Pag. 3, Fig. 3.
C. trochoide (Jeff. M. S.) var. *Petterseni*, Sars, Moll. reg. arc. Pag. 344, Tab. 33, Fig. 5.

Skallen skjæv oval, hvid solid, med 4 bugede Vindinger, Spiret noget ophøiet, afrundet, Suturen dyb; Mundaabningen rund, $^2/_3$ Del af Skallens Længde; indenfor Læberanden gaar en sammenhængende fortykket Rand. Der er ingen egentlig Umbilicus, men en mere eller mindre tydelig Split. Skallen er fuldstændig glat.

Størrelse: 2.5^{mm} Axiall. 2.3^{mm} Diam.

Forekomst: St. 31, 173 *b*, 192, 195, fra 107 til 650 Favne.

I Videnskb. Selskbs. Forhandlinger („Bidr. til Vestl. Molluskfauna") 1875, Pag. 60 har jeg, efter Dr. Jeffreys egen Bestemmelse, nævnt *Cyclostrema trochoide* Jeff. M. S. og opgiver følgende Maal for den ved Bergen fundne: 1^{mm} høi og 1.7^{mm} bred. Ved senere Undersøgelser er jeg kommen til det Resultat, at Exemplaret fra Bergen er *Cyclostrema lævigatum* (Jeff. M. S.) G. O. Sars og ikke *C trochoide*, G. O. Sars, hvilket ogsaa tydelig vil fremgaa af de angivne Maal. Prof. G. O. Sars er den Første, der i sit Værk, „Moll. reg. arct." 1878, Pag. 131, Pl. 8, Fig. 9, har givet en Beskrivelse og Tegning af *C. trochoide*. Jeg er med Prof. Sars tilbøielig at tro, at denne og *C. Petterseni* kun er Varieteter, men i saa Fald maa sidste Navn have Prioritetsret, da Beskrivelsen er af 1877, hvorimod hin er af 1878.

Cyclostrema millipunctatum, n. sp.

Tab. XI, Fig. 17, 18, *a*.

Skallen liden, fladtrykt, næsten skiveformig, hvid glindsende; Vindingerne 3, hvoraf sidste stærkt buget, Spiret hæver sig kun ubetydelig over sidste Vinding og Apex ligger i Niveau med første Vinding; Mundaabningen rund, Læben sammenhængende og indenfor Aabningen gaar, ligesom hos foregaaende Art, en Fortykkelse, dog ligger denne noget dybere inde; Umbilicus vid og dyb. Sculpturen er tilsyneladende glat, men under stærk Forstørrelse viser der sig over hele Skallen en fin, tæt og regelmæssig Punktering (Fig. 18 *a*).

Størrelse: 0.8^{mm} Axiall., 1.2^{mm} Diam.

Forekomst: St. 192—649 Favne.

I Habitus kommer denne Art nær *C. areolatum*, G. O. Sars, men Skulpturen er væsentlig forskjellig.

Cyclostrema Petterseni, Fr.

Pl. XI, figs. 15, 16.

C. Petterseni, Friele, „Prelim. Rep. Moll." Nyt. Mag. XXIII, 1877, pag. 3, fig. 3.
C. trochoide (Jeff. M. S.) var. *Petterseni*, Sars, Moll. reg. Arc. pag. 344, Pl. 33, fig. 5.

The shell slantingly oval, white, solid, with 4 swollen whorls; the spire somewhat elevated, rounded; suture deep; aperture circular, measuring two-third parts of the length of the shell; inside of the lip-edge a continuous tumification occurs. There is no umbilicus-proper, but a more or less distinct umbilical fissure. The shell is perfectly smooth.

Size. Axial length 2.5^{mm}, Diam. 2.3^{mm}.

Habitat: Stats. Nos. 31, 173 *b*, 192, 195. Depth, 107 to 650 fathoms.

I Vidensk. Selskbs. Forhandlinger „Bidr. til Vestl. Molluskfauna", 1875, pag. 60, I have, in accordance with Dr. Jeffrey's own determination, referred to *Cyclostrema trochoide* (Jeff. M. S.) and stated the size of the specimen found near Bergen as follows, Height, 1^{mm}, Breadth, 1.7^{mm}. On subsequent examination I have, however, arrived at the opinion, that this Bergen specimen is *Cyclostrema lævigatum* (Jeff. M. S.) G. O. Sars, and not *C. trochoide*, G. O. Sars, which will also be clearly seen from the dimensions stated. Prof. G. O. Sars is the first who — in his work „Moll. reg. arc." 1878 pag. 131, Pl. VIII, fig. 9 — has given a description and illustration of *C. trochoide*. I am disposed to believe, along with Prof. Sars, that it and *C. Petterseni* are only varieties, and in that case the latter designation has the right of priority, as its description dates from 1877, whilst the first named dates from 1878.

Cyclostrema millipunctatum, n. sp.

Pl. XI, figs. 17, 18, *a*.

Shell small, compressed, almost discoidal, lustrous white; 3 whorls, the ultimate one of which is strongly swollen; the spire is only inconsiderably raised above the ultimate whorl, and the apex lies level with the first whorl. The aperture circular; the lip continuous, and inside of the aperture there occurs, as in the preceding species, a tumification, but lying somewhat further in. Umbilicus wide, and deep. The sculpture is, apparently, smooth, but under powerful magnification, a minute, compact, regular, stippling appears visible over the entire shell (fig. 18 *a*).

Size. Axial length, 0.8^{mm}, Diam., 1.2^{mm}.

Habitat: Stat. No. 192. Depth, 649 fathoms.

In habitus this species approaches to *C. areolatum*, G. O. Sars, but the sculpture is essentially different.

Cyclostrema Willei, n. sp.

Pl. XI, fig. 19.

Skallen hvid solid, nedtrykt, Vindingerne 3, sidste stærkt buget, Spiret svagt hævet; Mundaabningen rund, Læben sammenhængende og uden nogen indvendig Fortykkelse; Umbilicus vid og dyb omtrent som hos foregaaende Art. Skulpturen bestaar af middelmaadig tætte Spiralstriæ over hele Skallen; paa den øvre Side er de dog svagere end paa Undersiden.

Størrelse: 1mm Axiall., 1.3mm Diam.

Forekomst: St. 173 *b*, 192 fra 300 til 649 Favne.

I ydre Form ligner denne foregaaende Art, kun er Spiret noget mere hævet.

Cyclostrema profundum, Fr.

Tab. XI, Fig. 20, 21, 22.

C. profundum, Friele, „Cat. Spitzb. Moll." Jahrb. Mal. Gesell. 1879, Pag. 272.

Skallen skjæv oval, noget solid, opac hvid, Vindingerne 4 raskt tiltagende, tumide, Spiret noget hævet, Suturen dyb; Mundaabningen rund, Læberanden skarp og indenfor denne gaar en svag Fortykkelse. Sculpturen bestaar af tætte fine Spiralstriæ, kun Apex er glat; Umbilicus dyb, men halvt dækket.

Størrelse: 2.5mm Axiall., 3mm Diam.

Forekomst: St. 192, 353, 357 fra 120 til 1333 Favne.

Dr. Jeffreys holder nærværende Form for en Varietet af *C. basistriatum*, Jeff., men denne Opfatning kan jeg ikke dele. Den ligner vistnok denne nærmest, men ved at sammenholde begge Arter, vil der vise sig en ikke uvæsentlig Forskjel baade i Form og Sculptur. Spiret er nemlig hos *C. basistriatum* mere hævet, Mundaabningen ikke saa udvidet og Sculpturen er aldrig saa regelmæssig og distinkt strieret over hele Skallen som hos *C. profundum*.

Paa den dybeste Station 1333 forekom den temmelig talrig i et Stykke Træ, der var stærkt gjennemboret af en *Teredo*. Den laa skjult dybt inde i Gangene.

Cyclostrema Willei, n. sp.

Pl. XI, fig. 19.

Shell white, solid, compressed; 3 whorls, of which the ultimate one strongly tumid; the spire slightly elevated; the aperture circular, the lip continuous, and without any internal tumification; umbilicus wide, and deep, about the same as in the preceding species. The sculpture consists of moderately close spiral striæ over the entire shell; on the upper surface the striæ are, however, more faint than on the lower surface.

Size. Axial length, 1mm, Diam., 1.3mm.

Habitat: Stats. Nos. 173 *b*, 192. Depth, 300 to 649 fathoms.

In Habitus it resembles the preceding species, except that the spire is somewhat more elevated.

Cyclostrema profundum, Fr.

Pl. XI, figs. 20, 21, 22.

C. profundum, Friele, „Cat. Spitzb. Moll." Jahrb. Mal. Gesell. 1879, pag. 272.

The shell obliquely oval, somewhat solid, opaque white; 4 tumid, rapidly increasing, whorls; spire somewhat elevated; suture deep; aperture circular; lip-edge sharp, and inside of it a slight tumification occurs. The sculpture consists of close, minute, spiral striæ, the apex alone being smooth. Umbilicus deep, but half covered.

Size. Axial length, 2.5mm, Diam., 3mm.

Habitat: Stats. Nos. 192, 353, 357. Depth, 120 to 1333 fathoms.

Dr. Jeffreys considers this form to be a variety of *C. basistriatum*, Jeff., but I cannot share that opinion. It, indeed, resembles it most, but on comparison of both species it will be apparent, that there is a not immaterial difference both in form and sculpture. The spire is, for instance, in *C. basistriatum* more elevated, the aperture not so dilated and the sculpture is never so regular and distinctly striated over the whole shell as in *C. profundum*.

In the deepest locality — 1333 fathoms — it occurred pretty abundantly in a piece of wood that was much perforated by a *Teredo*. It lay deeply concealed in the passages.

Amphisphyra hiemalis, Couth.

Var. **Loveni**, nob.

Pl. XII, Fig. 7, 8.

Spiret er om end noget nedsunket dog tydeligt i 2 Vindinger.

Paa St. 240—1000 Favne forekom 5 Exemplarer, der alle har tydeligt Spir, hvorimod et 6te har dette skjult, saaledes som regelmæssig er Tilfælde hos den udviklede *Amphisphyra hiemalis*, Couth. Størrelsen var dog omtrent den samme hos alle, nemlig omkring 3.5mm.

Dr. Jeffreys har gjort opmærksom paa, at det af Lovén observerede Spir hos *Amphisphyra globosa* kun er et Ungdomsstadie, men at det fuldstændig forsvinder senere, naar Skallen udvikler sig. I dette Tilfælde beholder imidlertid det overveiende Antal igjennem sin hele Udvikling Spiret.

Amphisphyra globosa, Lovén = *Utriculopsis vitrea*, Sars = *Bulla hiemalis*, Couth.

Philine Ossian Sarsi, Fr.

Tab. XII, Fig. 9, 10 *a*.

P. Ossian-Sarsi, Friele. „Prelim. Rep." Nyt Mag. XVIII 1877, Pag. 9, Fig. 19 *a, b, c.*

Skallen hvid, tynd, oval, oventil truncat; Vindingerne $2^1/_2$—3 er synlige paa Spiret, der ligger i Niveau med Hovedvindingen; Suturen er grund rundt den apicale Vinding, men tiltager senere i Dybde og ender i en fin Split; Ventralvindingen har omtrent halve Mundaabningens Størrelse; Mundaabningen er piriform, meget udvidet forneden, og sammenknebet, dog ikke tilspidset oventil; Læben er sinuos, er først udgaaende i en stump Vinkel og bøier saa i en noget indbugtet Linie nedad, den nedre Ende er bredt afrundet.

Sculpturen (Fig. 10 *a*) bestaar af talrige fine Spiralstriæ, der ser ud som Dobbellinier, idet en svagere og en stærkere stadig vexler; Linierne er under stærk Forstørrelse fint saugtakkede fremkommen derved, at de krydses af talrige fine Væxtstriber.

Tænderne ligne *Philine finmarchia's*.

Kroens 2 Kalkplader er ualmindelig store; de er ikke mindre end $^2/_3$ Dele af Skallens Længde.

Størrelse: 9mm Axiall., 6.5mm Diam.

Forekomst: St. 18—400 Favne.

Paa St. 87 og 295 — 488 og 1100 Favne — fandtes nogle Fragmenter af en *Philine*, som synes at tilhøre denne Art.

Amphisphyra hiemalis, Couth.

Var. **Lovéni**, nob.

Pl. XII, figs. 7, 8.

The spire although somewhat depressed is, yet, distinct in 2 whorls.

At station No. 240, Depth 1000 fathoms, 5 specimens were obtained, all of them having a distinct spire, whilst a sixth specimen has it concealed, as is uniformly the case with the developed *Amphisphyra hiemalis*, Couth. The size was, however, nearly uniform in all, viz. about 3.5mm.

Dr. Jeffreys has pointed out that the spire in *Amphisphyra globosa* observed by Lovén, relates to an immature stage, and that it, subsequently, completely disappears when the shell is developed. In the present case, however, the larger number retain the spire throughout the entire development.

Amphisphyra globosa, Lovén = *Utriculopsis vitrea*, Sars = *Bulla hiemalis*, Couth.

Philine Ossian-Sarsi, Fr.

Pl. XII, Figs. 9, 10 *a*.

P. Ossian-Sarsi, Friele. „Prelim. Rep." Nyt Mag. XVIII 1877, pag. 9, fig. 19 *a, b, c.*

Shell white, thin, oval, truncate superiorly. $2^1/_2$—3 whorls visible on the spire, which lies level with the Body-whorl; suture shallow round the apicial whorl, but increases in depth subsequently, and terminates in a minute fissure. The ventral whorl is about half the size of the aperture. The aperture is piriform, much dilated below, contracted above but not acuminated. The lip is sinuous, proceeding first at an obtuse angle, then curving in a somewhat concave line down-wards; the lower extremity is well rounded.

The sculpture (fig. 10 *a*) consists of numerous, fine, spiral striæ appearing as double lines, owing to a faint one and a more distinct one constantly alternating. Under powerful magnification the lines appear minutely serrated, from there being traversed by numerous fine lines of growth.

The *teeth* resemble those of *Philine finmarchia*.

The 2 calcareous plates of the gizzard are uncommonly large, and measure, not less than, two-third parts of the length of the shell.

Size. Axial length, 9mm. Diam., 6.5mm.

Habitat: Stat. No. 18. Depth, 400 fathoms.

At stations Nos. 87 and 295 (Depth 488 and 1100 fathoms) a few fragments of a *Philine* were found, which appear to pertain to this species.

Det er paa Tegningen angivet, at det afbildede Exemplar har været brudt. Dyret kom levende op, men under Contraktionen paa Spiritus er den fragile Skal brudt, dog ikke værre, end at den med største Nøiagtighed senere er sammensat, saa jeg tror min Tegning er fuldt korrekt, hvad Form angaar.

It is stated in the illustration that the specimen illustrated has been injured. The animal was brought up alive, but the fragile shell was broken by its shrivelling in alcohol, but not more so than permitted it to be put together with perfect accuracy subsequently, so that, I believe, my illustration is quite reliable as regards the form.

Asbjørnsenia, n. Gen.

Skallen oval, inæqvilateral, Laasen svag, har i høire Skal en enkel centralstillet Cardinaltand og i venstre en dobbel, ved hvis Basis sidder en mindre, svag Bitand.

Asbjørnsenia, n. gen.

Shell oval, inequilateral, the hinge faint; has, in the right-valve, a central cardinal tooth, and in the left-valve, a double one, at whose base a small indistinct secondary tooth is placed.

Asbjørnsenia striata, n. sp.

Pl. XII, Fig. 14 *a*, *b*.

Skallen hvid, halv gjennemsigtig aflang oval, noget sammentrykt, inæqvilateral, fortil kort, truncat, bagtil uddragen afrundet; Umbonerne er langt foranstillede, men ikke stærkt fremtrædende; Dorsalranden bøier foran i en skjæv Retning ned mod den truncate anterior Rand, bagtil synker den langsomt og ubetydelig bøiet mod den skarpt afrundede posterior Rand, Ventralranden svagt bøiet; Laasen svag, i høire Skal er en centralstillet, noget bagudbøiet Cardinaltand og en stumpvinklet Lateraltand, i venstre en dobbel Cardinaltand og ved sammes Basis en mindre Bitand. Muskelindtrykkene lader sig ikke med Sikkerhed udrede. Sculpturen betaar af talrige og tætte concentriske Striæ, kun Umbonerne er næsten glat.

Størrelse: 3^{mm} anteroposterior og 1.6^{mm} umboventral Diameter.[1]

Forekomst: St. 173 *b*—300 Favne.

Der forekom kun et dødt, men vel vedligeholdt Exemplar. Hvorvidt man her har et udviklet Individ eller en Unge for sig er vanskeligt at afgjøre. Laasbygningen er mig i ethvert Fald fuldstændig fremmed, saa jeg har fundet det nødvendigt at danne en ny Slægt for den. Vor mage-

[1] Jeg anvender Marqs. de Gregorios Terminæ for Maalangivelsen („Nomenclature des Coquilles" 1883), da jeg holder disse for de korrekteste og vil ikke give Anledning til Misforstaaelser. De er ogsaa anvendt under Gasterodoperne.

Asbjørnsenia striata, n. sp.

Pl. XII, fig. 14 *a*, *b*.

Shell white, semi-transparent, elongate oval, somewhat compressed, inequilateral, short anteriorly, truncate, posteriorly attenuated, rounded. The umboes are placed well forward, but not strongly prominent. The dorsal margin curves forward in a slanting direction down towards the truncate anterior margin, and, posteriorly, it sinks slowly and only slightly curved towards the sharply rounded posterior margin. Ventral margin faintly rounded; the hinge delicate, in the right-valve there is a centrally placed, somewhat posteriorly bent, cardinal tooth, and an obtuse angulated lateral tooth; in the left-valve, there is a double cardinal tooth and, at its base, a small secondary one. The muscular impressions cannot with certainty be elucidated. The sculpture consists of numerous, and compact, concentric striæ, the umboes, alone, being almost smooth.

Size. Anterio-posterior diameter, 3^{mm}, and umbo-ventral diameter, 1.6^{mm}.[1]

Habitat: Station, No. 173 *b*. Depth, 300 fathoms.

One dead, but well preserved, specimen, only, was obtained. Whether we have before us, here, an adult, or a juvenile specimen is difficult to determine. The hinge is, at any rate, quite strange to me, so that I have found it necessary to establish a new genus for it. I have

[1] I make use of Marqs. de Gregorios terms for the measurements („Nomenclature des Coquilles" 1883) as I consider them to be the most accurate, and as unlikely to occasion misunderstanding. They are, also, used with reference to the Gastopods.

lose Eventyrfortæller og Zoolog Peter Chr. Asbjørnsen har jeg villet mindes ved Valget af Slægtsnavnet.

Efter min Ven Dr. Jeffreys Anvisning placerer jeg *Asbjørnsenia* under Familien *Tellinidæ*.

desired to remember our inimitable fairy-talewriter and zoologist Peter Chr. Asbjørnsen in the choice of an appellation.

In accordance with Dr. Jeffrey's direction, I include *Asbjørnsenia* in the family of *Tellinidæ*.

Montacuta Vøringi, Fr.

Tab. XII, Fig. 11, 12 *a*.

Montacuta Vøringi, Friele, „Prelim. Rep." Nyt Mag. XXIII 1877, Pag. 1, Fig. 1, 1 *a*.

Montacuta Vøringi, Jeffreys, „Ligthning & Porcupine Exped." Part III, Pag. 697.

Skallen hvid, oval, noget convex, inæqvilateral, Umbonerne fremstaaende og anterior stillede, Laasen forholdsvis stærk og Tænderne fremtrædende. Sculpturen bestaar af uregelmæssige mere eller mindre distinkte Vækststriber, men forøvrigt glat. Farven er hvid, men en tyk brun Kruste bedækker en stor Del af Skallen.

Størrelse: 3^{mm} arterioposterior og 2.6^{mm} umboventral Diameter.

Forekomst: St. 1 (Sognefjorden) 630 Favne. Kun en enkel, hvad jeg holder for Venstreskal blev funden.

Prof. Münster har ha'vt den Godhed at sende mig en høire Skal fra Glacialleierne. Den har den dobbelte Størrelse af ovenfor beskrevne, er mere irregulær oval, har anterior Ende mere udtraget og noget tilspidset og posterior mere truncat. Umbonerne er ikke saa fremtrædende. I Fig. 12 har jeg givet en Afbildning deraf.

Ifølge Jeffreys er den fundet paa „Porcupine" Exped., og af Monterosato ved Palermo 87 Favne.

Montacuta Vøringi, Fr.

Pl. XII, figs. 11, 12 *a*.

Montacuta Vøringi, Friele, „Prelim. Rep." Nyt Mag. XXIII 1877, pag. 1, fig. 1, 1 *a*.

Montacuta Vøringi, Jeffreys „Lightning & Porcupine Exped. Part III, pag. 697.

Shell white, oval, somewhat convex, inequilateral; umboes projecting, and placed anteriorly; the hinge relatively strong, and the teeth prominent. The sculpture consists of irregular, more or less distinct, lines of growth; otherwise smooth. Colour white, but a thick brown crust clothes a large part of the shell.

Size. Anterio-posterior diameter, 3^{mm}, umbo-ventral diameter, 2.6^{mm}.

Habitat: Stat. No. 1 (Sogne Fjord). Depth, 630 fathoms. A single one, only, was obtained, which I consider to be a left-valve.

Prof. Münster has had the kindness to send me a right-valve from the glacial beds. It is double the size of the one described above, is less regularly oval, and has its anterior extremity more exserted and somewhat acuminate, and its posterior extremity more truncate. The umboes are not so prominent. I have illustrated it in fig. 12.

According to Jeffreys, it was obtained on the „Porcupine" Expedition, and by Monterosato near Palermo, depth 87 fathoms.

Lasæa pumila, Wood.

Pl. XII, Fig. 13 *a*, *b*.

Kellia pumila, S. Wood, Crag. Moll. Pag. 124, Tab. XII, Fig. 15 *a*, *b*.

Zoe pumila, Monterosato, „Conch. Mediter" Palermo, 1878, Pag. 9.

Lasæa pumila, Jeffreys, „Lightning & Porcupine Exped." Part III, Pag. 699.

S. Wood giver følgende Diagnose af Arten:

„Testa minima transversa, ovata obliqua, tumida," „valde inæqvilaterali, lævigata, polita; antice majiore et"

Lasæa pumila, Wood.

Pl. XII, fig. 13 *a*, *b*.

Kellia pumila, S. Wood, Crag. Moll., pag. 124, Pl. XII, fig. 15 *a*, *b*.

Zoe pumila, Monterosato, „Conch. Mediter.", Palermo, 1878 pag. 9.

Lasæa pumila, Jeffreys, „Lightning & Porcupine" Exped. Part III, pag. 699.

S. Wood gives the following diagnosis of the species:

„Testa minima transversa, ovata obliqua, tumida," „valde inæquilaterali, lævigata, polita; antice majore et"

„longiore, utrinque rotundata; dente cardinali unico, den-"
„tibus lateralibus magnis."

Fra Cragformen synes vor at afvige ved en mere regelmæssig rund oval Form.

Størrelsen er 2mm anteriopost. 1.6mm umboventr. Diam.

Forekomst: Den forekom kun paa St. 192—649 Favne.

Dr. Jeffreys og Monterosata har nævnt den fra Korea, Biscaybugten og Sicilien.

Lyonciella Jeffreysi, Fr.

Pl. XII, Fig. 15, 16.

Lyonciella Jeffreysi, Friele. „Cat. Spitzberg. Moll." Jahrb. Mal. Gesell. 1879, Pag. 269.

Skallen noget solid, hvid, oval trapezoideformig; posterior Dorsalrand næsten ret, anterior kort fremspringende og i en nær ret Vinkel bøier den ned mod Ventralranden, der atter krummer stærkt op mod den svagt afrundede posterior Rand. Umbonerne fremtrædende, foranbøiet og incurvat; Partiet fra Umbonerne og ned til bageste Ventralrand er opsvulmet, Dorsalpartiet er derimod nedtrykt og paa Skallens indvendige Side viser sig her en Fold. Sculpturen bestaar af talrige, svagt hævede Linier, der radierer ud fra Umbonerne mod Skallens Periferi, samt tætte, men uregelmæssig stærke Vækstlinier. Laaslinien er uden Tænder, Muskelindtrykkene tydelig. Indvendig er Skallen perlemorglindsende.

Størrelse: 23mm anteriopost. 26mm umboventr. Diam.

Forekomst: St. 295, 312 fra 656 til 1100 Favne.

I „Report on the scientific Results of the voy of Challenger" Zool. Vol. XIII Lamellibranchiata 1885, Pag. 73, Pl. XXV, Fig. 1, 1 *b* har Mr. Edgar A. Smith ogsaa beskrevet en *Lyonciella Jeffreysi*. Der synes ikke at være saa liden Lighed imellem disse to, der tilfældigvis har faaet samme Navn, men de er dog neppe nok samme Art. Mr. Smiths *Jeffreysi* er nemlig foran mere truncat og ikke saa fremspringende og posterior mere afrundet. For ikke at faa Confusion vil jeg foreslaa *Lyonciella Smidti* for Challenger-Arten.

Det er mig en Tilfredsstillelse at se, at ogsaa Mr. Smith (l. c. Pag. 165) under de kritiske Bemærkninger over Slægten *Verticordia*, Wood, kommer til de samme Resultater, som jeg allerede i 1879 („Cat. Spitzb. Moll." Jahrb. Mal.

„longiore, utrinque rotundata; dente cardinali unico, den-"
„tibus lateralibus magnis."

Ours appears to differ from the Crag-form in having a more regular rounded oval form.

Size. Anterio-posterior diameter, 2mm, umbo-ventral diameter, 1.6mm.

Habitat: It occurred, only, at station No. 192. Depth 649 fathoms.

Dr. Jeffreys and Monterosata have cited it from the Corea, Bay of Biscay, and Sicily.

Lyonciella Jeffreysi, Fr.

Pl. XII, figs. 15, 16.

Lyonciella Jeffreysi, Friele „Cat. Spitzberg. Moll." Jahrb. Mal. Gesell. 1879, pag. 269.

Shell somewhat solid, white, oval-trapezoidal, posterio-dorsal margin almost straight, anterio-dorsal margin short and projectant, and curving at a nearly right angle, down towards the ventral margin, which, again, bends sharply upwards towards the slightly rounded posterior margin. The umboes prominent, bent forward and incurvate. The portion of the shell, from the umboes down to the posterior ventral margin is dilated. The dorsal portion is, on the contrary, flattened, and upon the interior side of the shell a fold is, here, visible. The sculpture consists of numerous, slightly elevated, lines, which radiate from the umboes towards the periphery of the shell, and, also, of close but irregular, strong, lines of growth. The hinge line is devoid of teeth. The muscular impressions distinct. The shell has, interiorly, a mother-of-pearl lustre.

Size. Anterio-posterior diameter, 23mm, umbo-ventral diameter, 26mm.

Habitat: Stats. Nos. 295, 312. Depth, 656 to 1100 fathoms.

In „Report on the scientific Results of the Voy. of Challenger" Zool. Vol. XIII. Lamellibranchiata, 1885, pag. 73, Pl. XXV, figs. 1, 1 *b*. Mr. Edgar A. Smith has, also, described a *Lyonciella Jeffreysi*. There appears to be no inconsiderable resemblance between these two, which have accidentally obtained the same designation, but they pertain, however, barely enough to the same species. Mr. Smith's *Jeffreysi* is, for instance, more truncate anteriorly and not so protuberant, and its posterior is more rounded. To prevent confusion, I would suggest *Lyonciella Smidti* as a designation for the Challenger species.

It is with much satisfaction I observe that Mr. Smith, also, (l. c. pag. 165) in his critical remarks upon the genus *Verticordia*, Wood, arrives at the same results as I, already in 1879, had expressed („Cat. Spitzb. Moll." Jahrb.

Gesell. 1879, Pag. 269) har udtalt nemlig, at Slægten *Lyonciella*, M. Sars bør opretholdes og at Dr. Jeffreys med urette sammendrog denne Slægt med *Pecchiolia*, Menegh.

Brachiopoda.

Terebratula (Liothyris) arctica, Fr.

Tab. XII, Fig. 17, 18 *a*, *b*.

T. arctica, Friele, „Jan Mayen Moll." Nyt Mag. XXIV, 1878, Pag. 221, Fig. 1 *a—c*.

Skallen oval, lig *T. minor*, dog forholdsvis kortere, Rostrum kort, Foramen complet, men svagt. Deltidium bliver næsten skjult under den hoemale Skals Umbo. Apophysis svag.

Størrelse: 14^{mm} lang, 12.5^{mm} bred, 8^{mm} tyk.

Forekomst: St. 237 (Jan Mayen) 263 Favne.

Fra *Terebratula vitrea var. minor*, Phil. adskiller vor Art sig ved at være forholdsvis kortere, mere kantet afrundet og mere globos. Dertil er Rostrum kortere og Løkken svagere.

Dr. Jeffreys reducerte denne Form til en Varietet af *Terebratula vitrea*, men den fortrinlige Brachiopodekjender Dr. Ths. Davidson finder, at den bør opretholdes som god Art. Strax før sin Død skriver han til mig: „I determine, contrary to Dr. Jeffrey's opinion, to retain your species as distinct."

Mall. Gesell. 1879, pag. 269) viz. that the genus *Lyonciella*, M. Sars, ought to be maintained, and that Dr. Jeffreys, erroneously includes that genus with *Pecchiolia*, Menegh.

Brachiopoda.

Terebratula, (Liothyris) arctica, Fr.

Pl. XII, figs. 17, 18 *a*, *b*.

T. arctica, Friele, „Jan Mayen Moll." Nyt Mag. XXIV, 1878, pag. 221, fig. 1 *a—c*.

Shell oval, resembling that of *T. minor*, but relatively shorter; rostrum short; foramen complete, but faint. The deltidium is nearly concealed under the hæmal shell's umbo; apophysis faint.

Size. Length, 14^{mm}, Breadth, 12.5^{mm}, Thickness, 8^{mm}.

Habitat: Station, No. 237 (Jan Mayen). Depth, 263 fathoms.

Our species differs from *Terebratula vitrea*, *var. minor*, Phil. in being, relatively, shorter, more squarely rounded and more globular. Further, the rostrum is shorter and the loop fainter.

Dr. Jeffreys reduced this form to a variety of *Terebratula vitrea*, but the eminent Brachiopodist Dr. Thos. Davidson considered that it ought to be maintained as an independent species. Immediately prior to his death, he wrote to me in these words „I determine, contrary to Dr. Jeffrey's opinion, to retain your species as distinct."

Forklaring over Tavlerne.

Pl. VII, Fig.	1.	*Bela*	*rugulata*,	Troschel.
—	1 *a*.	—	—	Apex.
—	1 *b*.	—	—	Et Stykke af den vinklede Del paa sidste Vinding, forstørret.
—	2.	—	—	var. *clathratus*, nob.
—	2 *b*.	—	—	Operculum.
—	3, 4.	—	—	var. *Spitzbergensis*, nob.
—	3 *a*.	—	—	„ — Operculum.
—	5, 6.	—	—	var. *bergensis*, nob.
—	5 *a*, *b*.	—	—	„ — Apex.
—	5 *c*.	—	—	„ — Operculum.
—	7.	—	—	var. *scalaroides*, G. O. Sars.
—	7 *a*.	—	—	„ — Apex.
—	7 *b*.	—	—	„ — Operculum.
—	8.	—	*nobilis*, Møll.	
—	8 *a*.	—	—	Et Stykke af den vinklede Del paa sidste Vinding, forstørret.
—	8 *b*.	—	—	Operculum.
—	9.	—	*scalaris*, Møll. var. *ecarinata*, Sars.	
—	10, 11.	—	*scalaris*, Møll.	
—	10 *a*.	—	—	Operculum.
—	12, 13.	—	—	var. *abyssicola*, nob.
—	14 *a*, *b*.	—	—	„ — Apex.
—	15, 16, 17	—	*obliqua*, G. O. Sars.	
—	15 *a*, *b*.	—	—	Apex.
—	15 *c*	—	—	Operculum.
—	18, 19.	—	*cancellata*, Migh.	
—	18 *a*.	—	—	Apex.
—	20, 21, 22	—	—	var. *declivis*, Lovén.

Explanation of the Plates.

Pl. VII, figs.	1.	*Bela*	*rugulata*,	Troschel.
—	1 *a*.	—	—	apex.
—	1 *b*.	—	—	a fragment of the shouldered part of the ultimate whorl; magnified.
—	2.	—	—	var. *clathratus*, nob.
—	2 *b*.	—	—	operculum.
—	3, 4.	—	—	var. *Spitzbergensis*, nob.
—	3 *a*.	—	—	„ — operculum.
—	5, 6.	—	—	var. *bergensis*, nob.
—	5 *a*, *b*.	—	—	„ — apex.
—	5 *c*.	—	—	„ — operculum.
—	7.	—	—	var. *scalaroides*, G. O. Sars.
—	7 *a*.	—	—	„ — apex.
—	7 *b*.	—	—	„ — operculum.
—	8.	—	*nobilis*, Møll.	
—	8 *a*.	—	—	, a fragment of the shouldered part of the ultimate whorl; magnified.
—	8 *b*.	—	—	operculum.
—	9.	—	*scalaris*, Møll., var. *ecarinata*, Sars.	
—	10, 11.	—	*scalaris*, Møll.	
—	10 *a*.	—	—	operculum.
—	12, 13.	—	—	var. *abyssicola*, nob.
—	14 a, *b*.	—	—	„ — apex.
—	15, 16, 17	—	*obliqua*, G. O. Sars.	
—	15 *a*, *b*.	—	—	apex.
—	15 *c*.	—	—	operculum.
—	18, 19.	—	*cancellata*, Migh.	
—	18 *a*.	—	—	apex.
—	20—22.	—	—	var. *declivis*, Lovén.

Pl. VII, Fig. 20 *a*, *b*. *Bela cancellata*, var. *declivis*, Apex.
— 23 — *cinerea*, Møll.
— 23 *a*. — — Operculum.
Pl. VIII, — 1, 2. — *impressa*, Beck.
— 1 *a*. — — Operculum.
— 1 *b*. — — Apex.
— 3, 4, 5. — *Sarsi*, Verrill.
— 3 *a*. — — Apex.
— 3 *b*. — — Operculum.
— 6. — *Schmidti*, Fr.
— 7 til 10 — *Trevelyana*, Turt.
— 9 *a*. — — Operculum.
— 9 *b*, *c*. — — Apex.
— 11. — *decussata*, Couth. var. *finmarchia*, nob.
— 12, 13. — *decussata*, Couth.
— 12 *a*, *b*. — — Apex.
— 14. — — var. *conoidea*, G. O. Sars.
— 14 *a*. — — Apex.
— 15. — *Kobelti*, Verkr. Apex.
— 16, 17. — *tenuicostata*, M. Sars, var. *Willei*, Fr.
— 17 *a*, *b*. — — Apex.
— 17 *c*. — — Operculum.
— 18. — *bicarinata*, Couth.
— 19. — — var. *geminolineata*, Friele.
— 20. — *Schantaricum*, Midd.
— 20 *a*. — — juv.
— 20 *b*. — — Operculum.
— 21, 22. — *ovalis*, Friele.
— 22 *a*. — — Apex.
— 23. — *Koreni*, n. sp.
— 23 *a*. — — Apex.
— 24. — *exarata* Møll. Operculum.
— 25. — *pyramidalis*, Strøm, Operculum.
— 26, 26 *a*. — *Pingeli*, Møll. Operculum.
— 27 til 30. *Admete viridula*, Fabr.
— 31, 32. — *contabulata*, Friele.
— 33. — *inflata*, „
Pl. IX, — 1 til 5. Tænder af *Bela rugulata*, Trosch.
— 6. — „ — — var. *spitzbergensis*.
— 7, 8. — „ — — var. *bergensis*.
— 9, 10. — „ — — var. *assimilis*, Sars.
— 11, 12. — „ — — var ! *scalaroides*, Sars.
— 13, 14, 15. — „ — *nobilis*, Møll.
— 16 til 20. — „ — *scalaris*, „
— 21, 22. — „ — — var. *abyssicola*.
— 23, 24. — „ — *harpularia*, Couth.
— 25. — „ — *turricula*, Mont.

Pl. VII, figs. 20 *a*, *b*. *Bela cancellata*, var. *declivis*, apex.
— 23. — *cinerea*, Møll.
— 23 *a*. — — operculum.
Pl. VIII, — 1, 2. — *impressa*, Beck.
— 1 *a*. — — operculum.
— 1 *b*. — — apex.
— 3—5 — *Sarsi*, Verrill.
— 3 *a*. — — apex.
— 3 *b*. — — operculum.
— 6. — *Schmidti*, Fr.
— 7—10. — *Trevelyana*, Turt.
— 9 *a*. — — operculum.
— 9 *b*, *c*. — — apex.
— 11. — *decussata*, Couth. var. *finmarchia*. nob.
— 12, 13. — *decussata*, Couth.
— 12 *a*, *b*. — — apex.
— 14. — — var. *conoidea*, G. O. Sars.
— 14 *a*. — — apex.
— 15. — *Kobelti*, Verkr. apex.
— 16, 17. — *tenuiscostata*, M. Sars, var. *Wilei*, Fr.
— 17 *a*, *b*. — — apex.
— 17 *c*. — — operculum.
— 18. — *bicarinata*, Couth.
— 19. — — var. *geminolineata*, Friele.
— 20. — *Schantaricum*, Midd.
— 20 *a*. — — juv.
— 20 *b*. — — operculum.
— 21, 22. — *ovalis*, Friele.
— 22 *a*. — — apex.
— 23. — *Koreni*, n. sp.
— 23 *a*. — — apex.
— 24. — *exarata*, Møll. operculum.
— 25. — *pyramidalis*, Strøm, operculum.
— 26, 26 *a*. — *Pingeli*, Møll., operculum.
— 27—30. *Admeté viridula*, Fabr.
— 31,, 32. — *contabulata*, Friele.
— 33. — *inflata*, Friele.
Pl. IX, — 1—5 Dentation of *Bela rugulata*, Trosch.
— 6. — „ — — var. *spitzbergensis*.
— 7, 8. — „ — — var. *bergensis*.
— 9, 10. — „ — — var. *assimilis*, Sars.
— 11, 12. — „ — — var. *scalaroides*, Sars.
— 13, 14, 15. — „ — *nobilis*, Møll.
— 16—20. — „ — *scalaris*.
— 21, 22. — „ — *scalaris*, var. *abyssicola*.
— 23, 24. — „ — *harpularia*, Couth.
— 25. — „ — *turricula*, Mont.

Pl. X, Fig. 1, 2. Tænder af *Bela obliqua*, G. O. Sars.
— 3, 4. — „ — *cancellata*, Migh.
— 5. — „ — — var. *declivis*, Lovén.
— 6. — „ — *cinerea*, Møll.
— 7, 8. — „ — *Sarsi*, Verrill.
— 9, *a*, *b*. — „ — *impressa*, Beck.
— 9 *c*, *d*. — „ — — Manubrium stærkt forstørret.
— 10, 11. — „ — *Trevelyana*, Turt.
— 12, 13. — „ — *decussata*, Couth.
— 14. — „ — *tenuicostata*, M. Sars.
— 15. — „ — *bicarinata*, Couth.
— 16. — „ — — var. *geminolineata*.
— 17, 18. — „ — *Schantarica*, Midd.
— 19. — „ — *ovalis*, Fr.
— 20, — „ — *Pingeli*, Møll.
— 21. — „ — *pyramidalis*, Strøm.
— 22. — „ *Defrancia amoena*, G. O. Sars.

Pl. XI, — 1. *Natica bathybii*, Fr.
— 2. — — var. *oblonga*.
— 3, 4. *Velutina Schneideri*, n. sp.
— 5. *Rissoa Verrilli*, n. sp.
— 5 *a*. — — Et Stykke af Skallen stærkt forstørret.
— 6, 7. — *Jan-Mayeni*, Fr.
— 8, 9. — *islandica*, n. sp.
— 10. — *Griegi*, Fr.
— 11. *Odostomia sublustris*, n. sp.
— 11 *a*. — — Apex.
— 12. — *Normani*, n. sp.
— 13, 14, *a*. *Eulima Lauræ*, n. sp.
— 15, 16. *Cyclostrema Petterseni*, Fr.
— 17, 18 — *millipunctata*, n. sp.
— 18 *a*. — — Et Stykke at Skallen stærkt forstørret.
— 19. — *Willei*, n, sp.
— 20, 21. — *profundum*, Fr.
— 22, 23. *Margarita umbilicalis*, Br. & Sowb.

Pl. XII, — 1. — *striata*, Br. & Sowb.
— 2, 3. — — var. *margaritifera*, nob.
— 4, 5, 6. *Solariella lævis*, n. sp.
— 7, 8. *Amphisphyra hiemalis*, Gld. var. *Lovéni*, nob.
— 9, 10. *Philine Ossian-Sarsi*, Fr.
— 10 *a*. — — Et Stykke af Skallen stærkt forstørret.

Pl. X, figs. 1, 2. Dentation of *Bela obliqua*, G. O. Sars.
— 3, 4. — „ — *cancellata*, Migh.
— 5. — „ — — var. *declivis*, Lovén.
— 6. — „ — *cinerea*, Møll.
— 7, 8. — „ — *Sarsi*, Verrill.
— 9, *a*, *b*. — „ — *impressa*, Beck.
— 9 *c*, *d*. — „ — — manubrium strongly magnified.
— 10, 11. — „ — *Trevelyana*, Turt.
— 12, 13. — „ — *decussata*, Couth.
— 14. — „ — *tenuicostata*, M. Sars.
— 15. — „ — *bicarinata*, Couth.
— 16. — „ — — var. *geminolineata*.
— 17, 18. — „ — *Schantarica*, Midd.
— 19. — „ — *ovalis*, Fr.
— 20. — „ — *Pingeli*, Møll.
— 21. — „ — *pyramidalis*, Strøm.
— 22. — „ *Defrancia amoena*, G. O. Sars.

Pl. XI, — 1. *Natica bathybii*, Fr.
— 2. — — var. *oblonga*.
— 3, 4. *Velutina Schneideri*, n. sp.
— 5. *Rissoa Verrilli*, n. sp.
— 5 *a*. — — a fragment of the shell; strongly magnified.
— 6, 7. — *Jan-Mayeni*, Fr.
— 8, 9. — *islandica*, n. sp.
— 10. — *Griegi*, Fr.
— 11. *Odostomia sublustris*, n. sp.
— 11 a. — — apex.
— 12. — *Normani*, n. sp.
— 13, 14 *a*. *Eulima Lauræ*, n. sp.
— 15, 16. *Cyclostrema Petterseni*, Fr.
— 17, 18. — *millipunctata*, n. sp.
— 18 *a*. — — a fragment of the shell; strongly magnified.
— 19. — *Willei*, n. sp.
— 20, 21. — *profundum*, Fr.
— 22, 23. *Margarita umbilicalis*, Br. and Sowb.

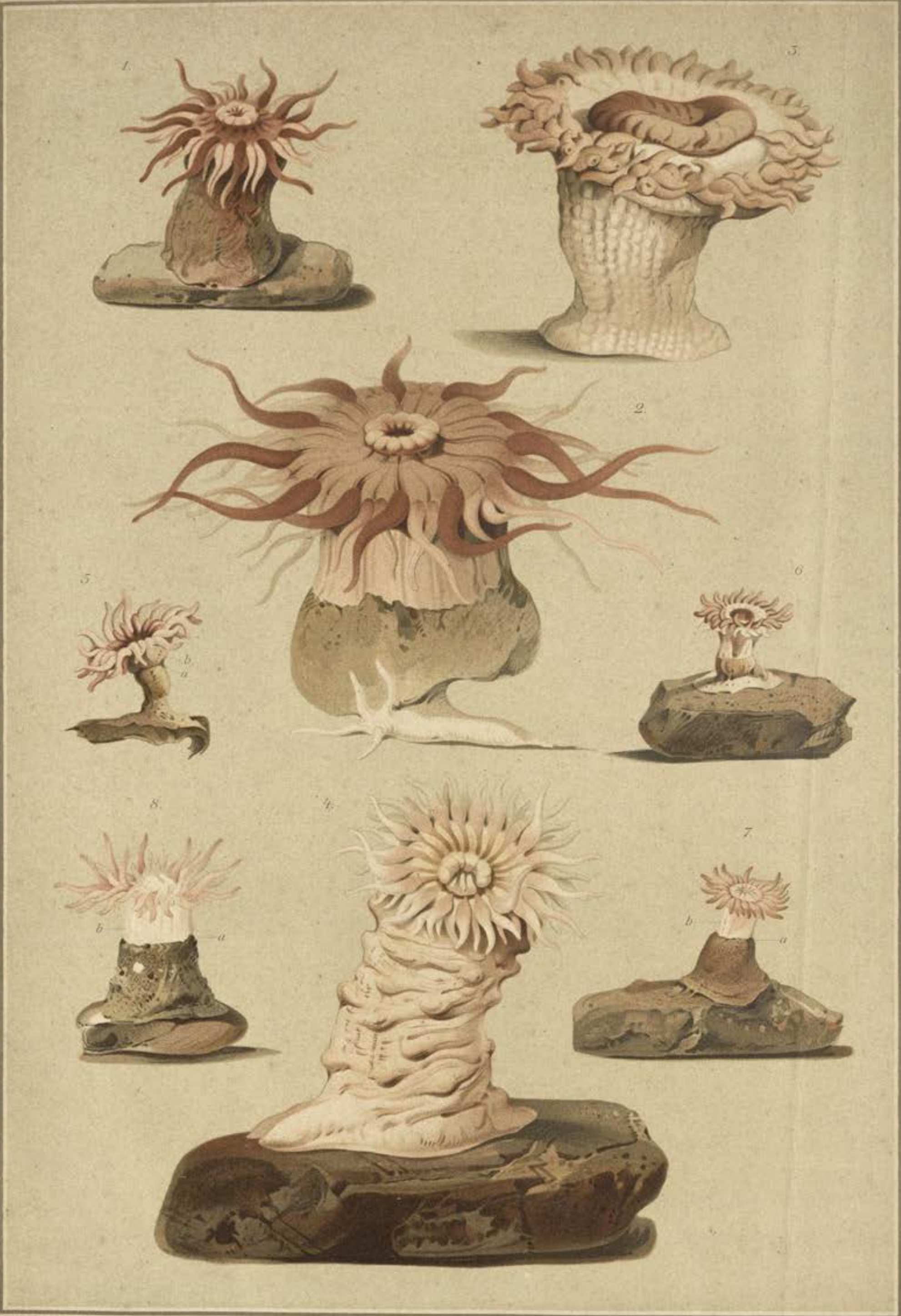
Pl. XII, — 1. — *striata*, Br. & Sowb.
— 2, 3. — — var. *margaritifera*, nob.
— 4—6. *Solariella lævis*, n. sp.
— 7, 8. *Amphisphyra hiemalis*, Gld, var. *Lovéni*, nob.
— 9, 10. *Philine Ossian-Sarsi*, Friele.
— 10 *a*. — — a fragment of the shell; strongly magnified.

Pl. XII. Fig. 11, 12. *Montacuta Vøringi*, Fr.
— 12 *a*. — — Laaset.
— 13. *Lasæa pumila*, Wood.
— 13 *a*, *b*. — — Laaset.
— 14. *Asbjørnsenia striata*, n. gen. & sp.
— 14 *a*, *b*. — — Laaset.
— 15, 16. *Lyonsiella Jeffreysi*, Fr.
— 17, 18 *a*, *b*. *Terebratula arctica*, Fr.

Pl. XII, figs. 11. 12. *Montacuta Vøringi*, Fr.
— 12 *a*. — — the hinge.
— 13. *Lasæa pumilla*, Wood.
— 13 *a*, *b*. — — the hinge.
— 14. *Asbjørnsenia striata*, n. gen. & sp.
— 14 *a*, *b*. — — the hinge.
— 15, 16. *Lyonsiella Jeffreysi*, Fr.
— 17, 18 *a*, *b*. *Terebratula arctica*, Fr.

F. W. Schlerth del. Lith. Anst. v. Werner & Winter, Frankfurt a/M.

1. Anthosactis Jan Mayeni n.g.et.sp. 2. Calliactis Kroyeri n.g.et.sp. 3. Allantactis parasitica n.g.et.sp.
4. 5. Stilidiactis Mopsea n.g.et.sp. 6. 7. Stilidiactis Tubularia n.sp.
8. Kylindrosactis elegans n.g.et.sp.

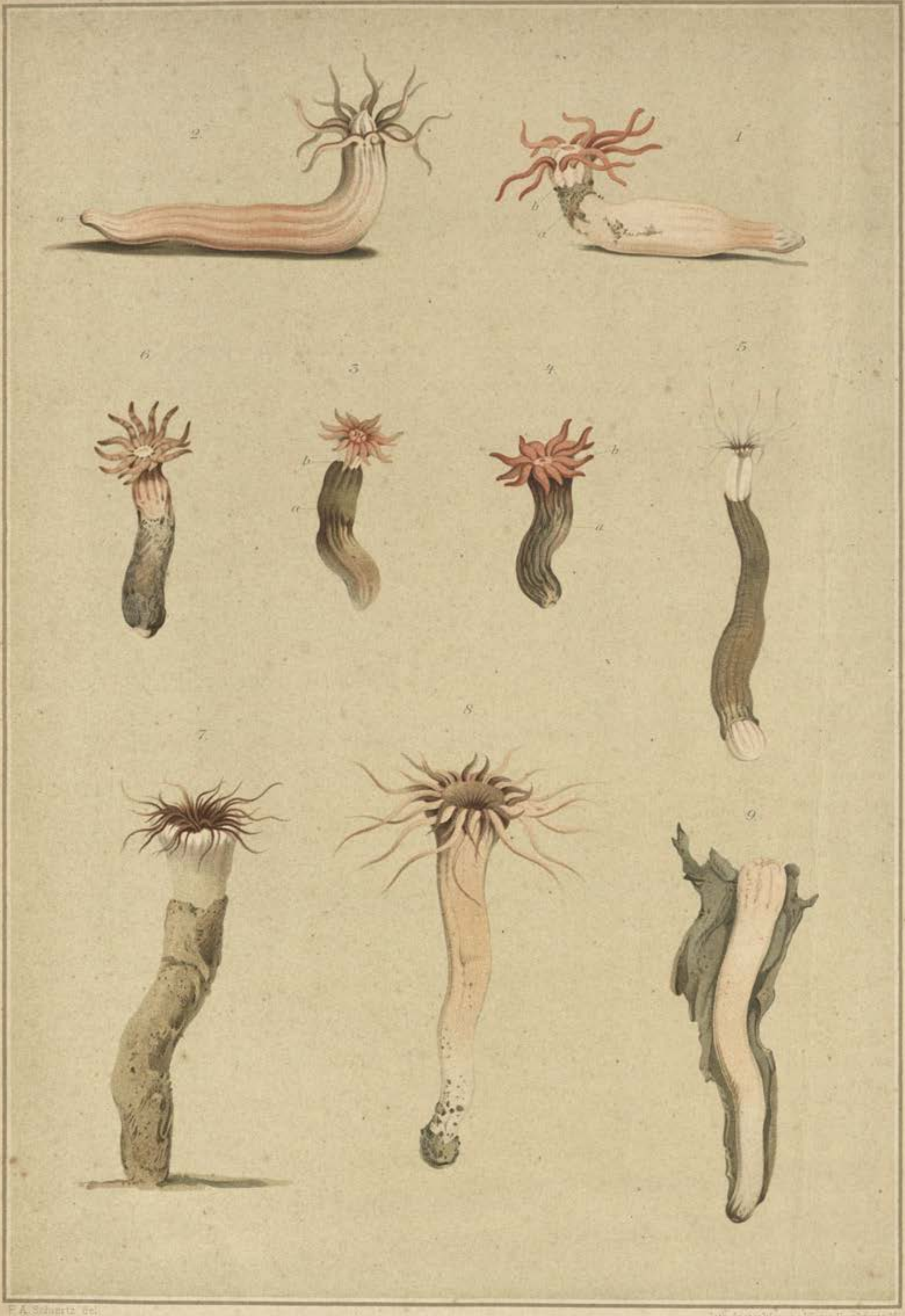


Lith. Anst. v. Werner & Winter, Frankfurt a/M.

1. 2. Sagartia abyssicola n. sp. 3. Bunodes abyssorum n. sp. 4. Actinauge nodosa.
5. Phellia flexibilis n. sp. 6. Phellia flexibilis variet. 7. Phellia margaritacea n. sp.
8. Phellia arctica n. sp.

F. W. Schiertz del.
Lith. Anst. v. Werner & Winter, Frankfurt a/M.

1.2.3.4. Phellia bathybia n. sp. 5–6. Phellia norvegica n. sp. 7. Phellia violacea. n. sp.
8. Phellia spitsbergensis n. sp. 9. Phellia crassa n. sp. 10–11. Andvakia mirabilis n. g. et sp.
12. Sagartia splendens n. sp.



F. A. Schwartz del.

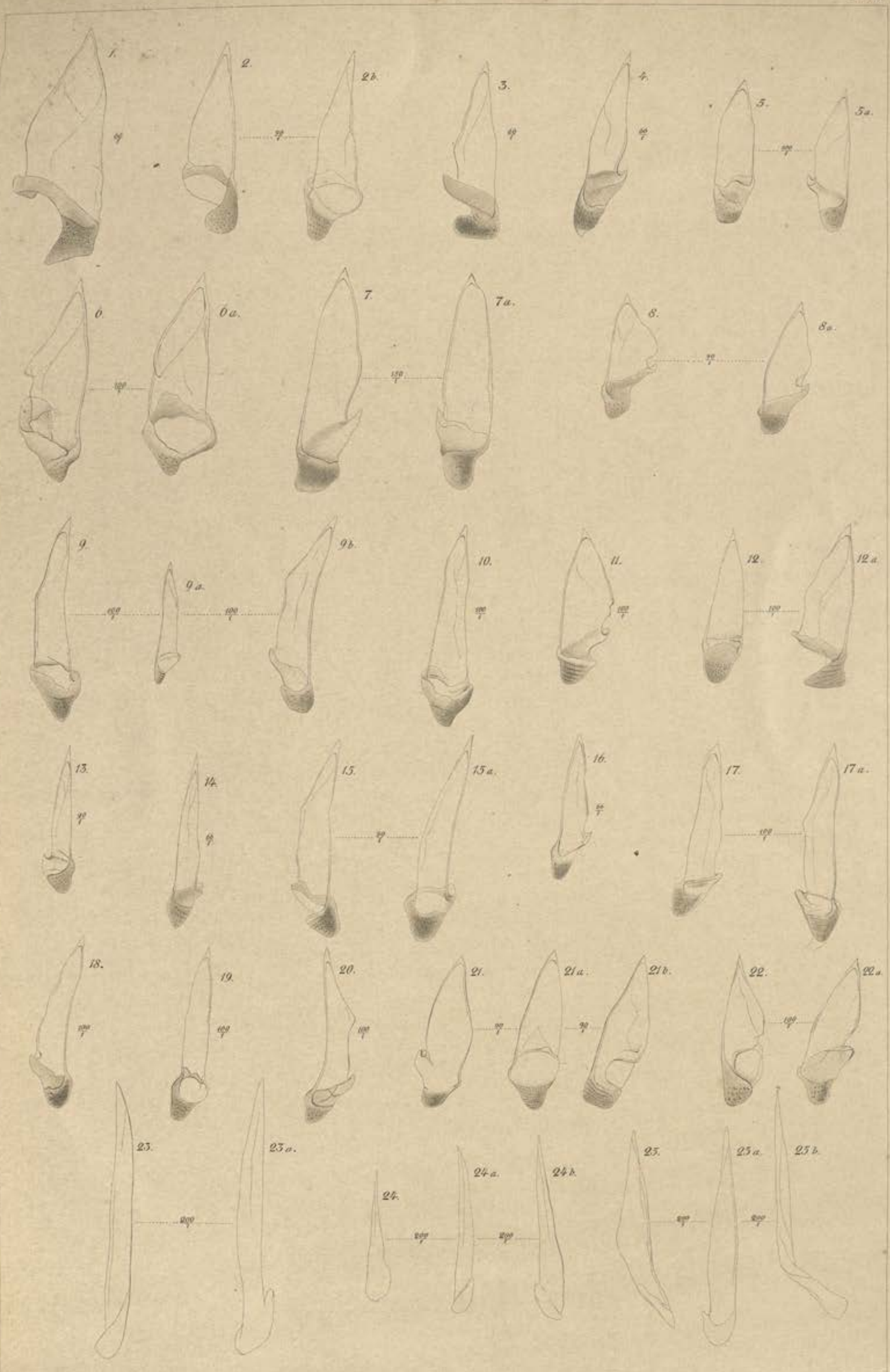
Lith. Anst. v. Werner & Winter, Frankfurt a/M.

1. Halcampoides abyssorum. 2. Fenja mirabilis. 3. Edwardsioides vitrea.
4. Aegir frigidus. 5. Edwardsia Andresi. 6. Edwardsia fusca.
7. Cerianthus abyssorum. 8. 9. Cerianthus ...

Tab. VII

Friele del.

Lith. Anst. v. Werner & Winter, Frankfurt a/M.



Tröle del.

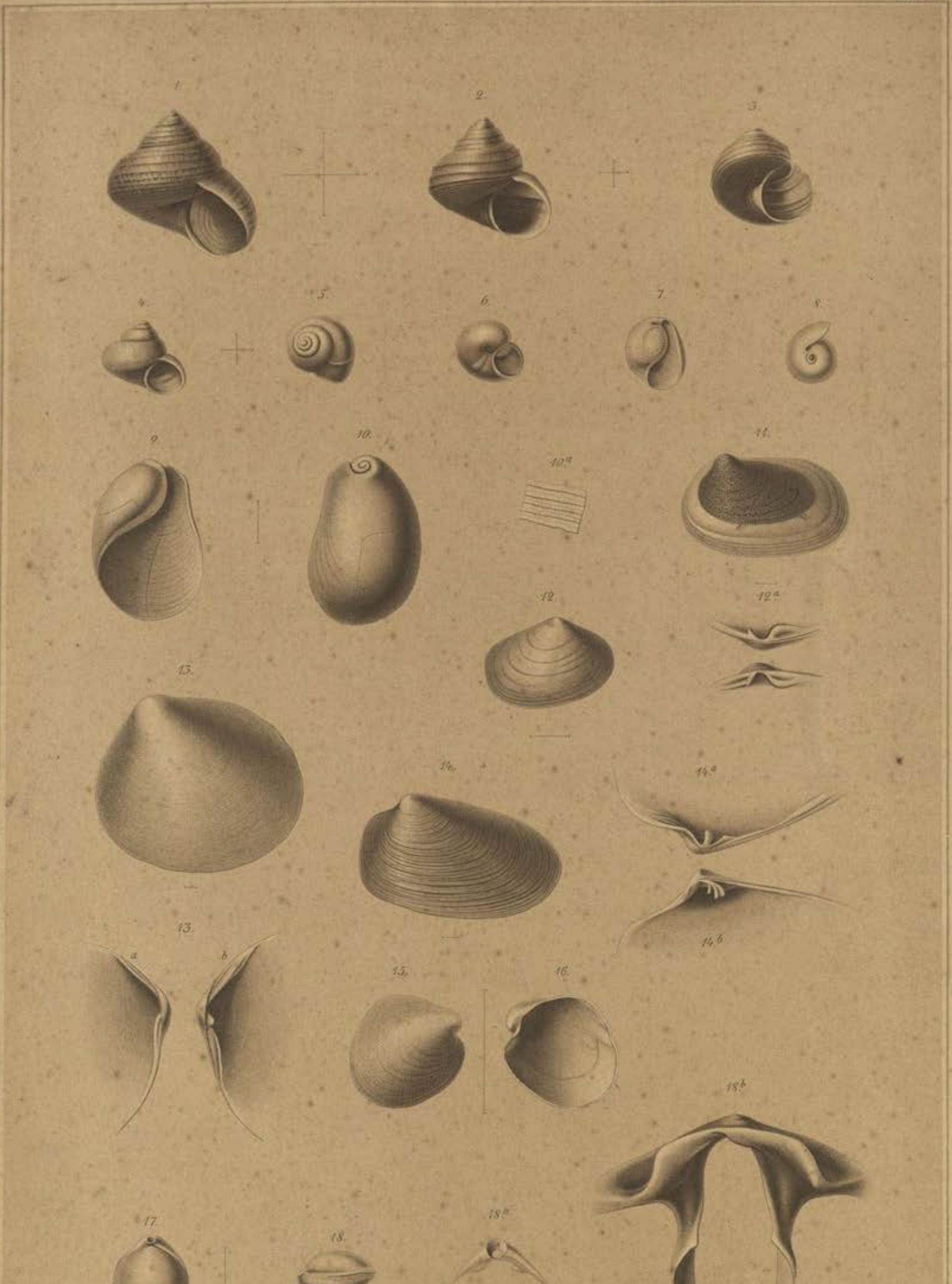
Lith. Anst. v. Werner & Winter, Frankfurt a/M.

Friele del.

Lith. Anst. v. Werner & Winter, Frankfurt M.

Fincle del.

Lith. Anst. v. Werner & Winter, Frankfurt a/M.



Friele del.

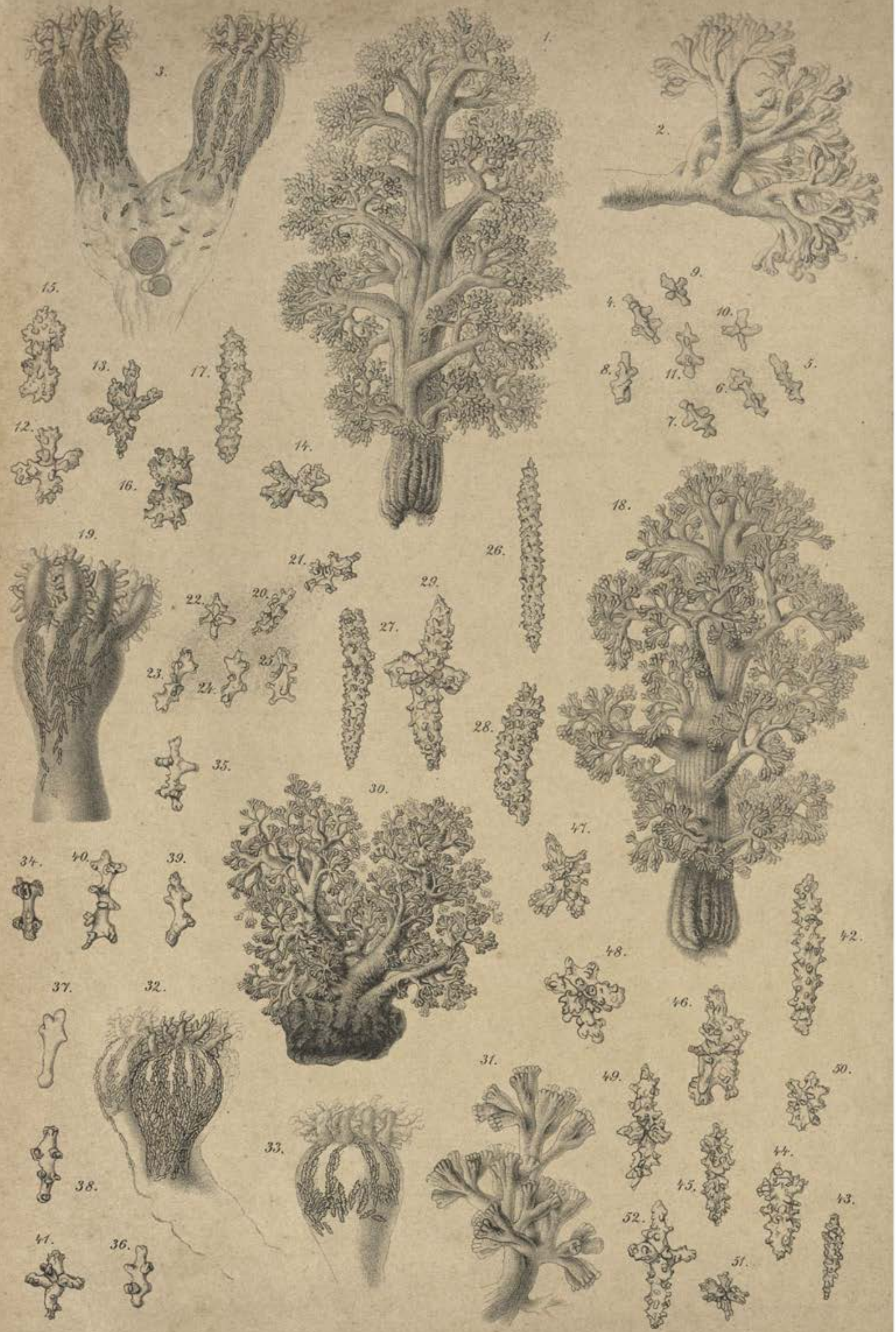
Lith. Anst. v. Werner & Winter, Frankfurt a/M.

H. Bucher jun. del. Lith. Anst. v. J. G. Bach, Leipzig.

Vöringia mirabilis, n. g. et sp.

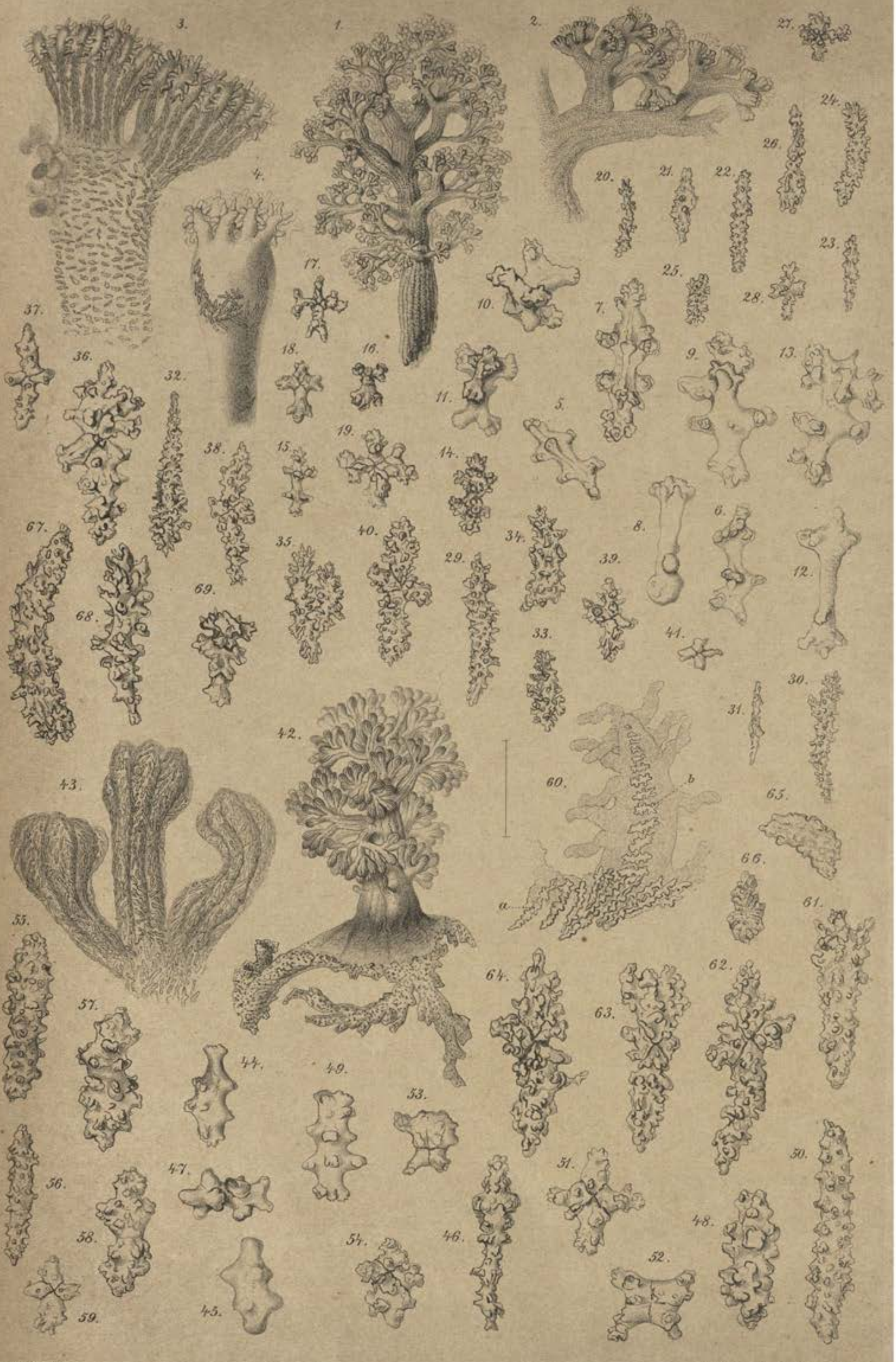
H. Bucher, jur. del. Lith. Anst. v. J. G. Bach, Leipzig.

Vöringia mirab: n. g. et sp. 1-2. Vöring: fruticosa, nob. 3-13. Vöring: abyssicola. n. sp. 14-41. Duva arborescens, n. sp. 42-54.



H. Bucher jun. del. Lith. Anst. v. J. G. Bach, Leipzig.

Duva arborescens, n. sp. 1-17. Duva spitsbergensis, n. sp., 18-29. Duva violacea, n. sp., 30-52.

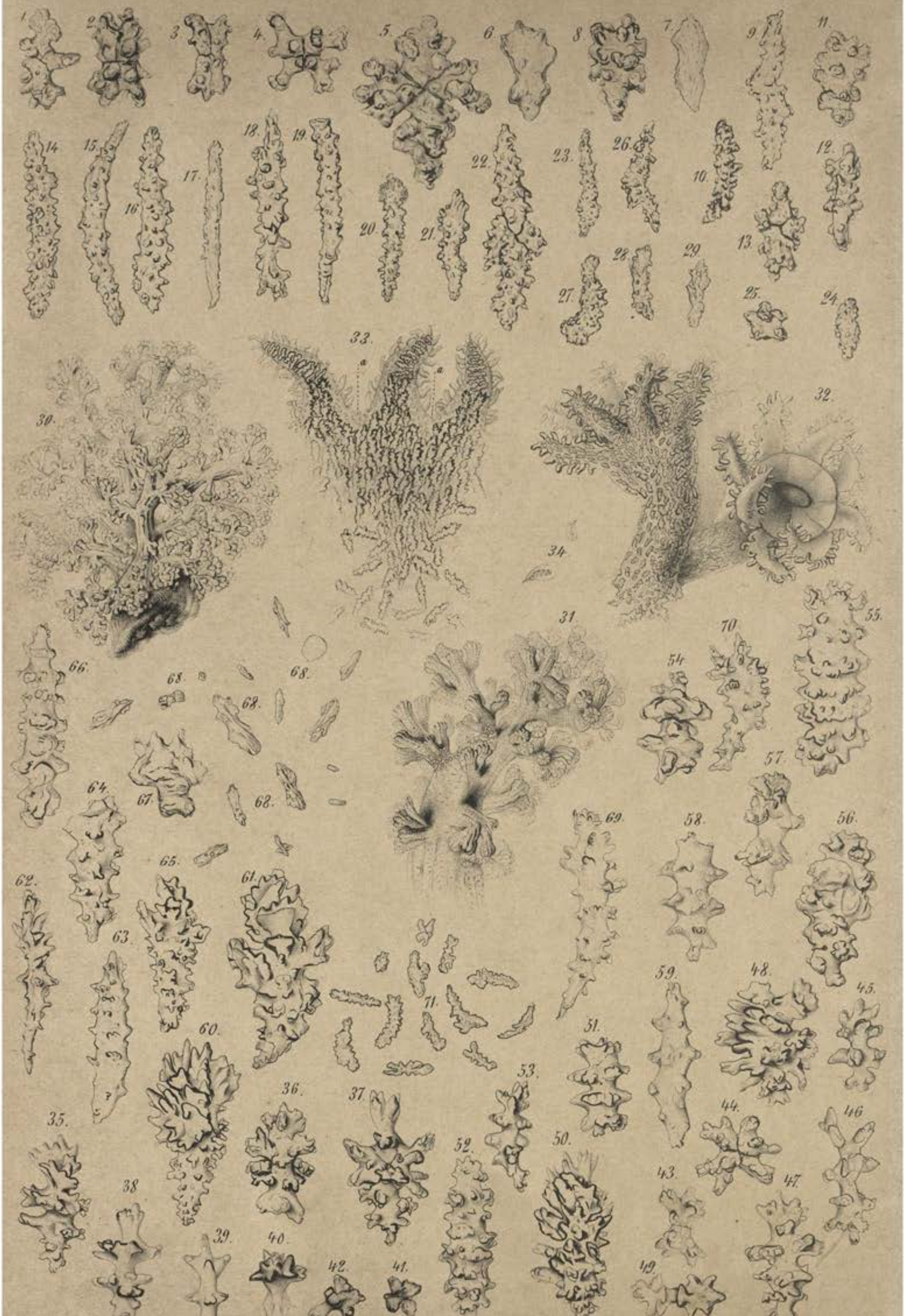


H. Bucher jun. del. Lith. Anst. v. J. G. Bach, Leipzig.

Duva aurantiaca n. sp. 1-41. Duva frigida n. sp. 42-60.

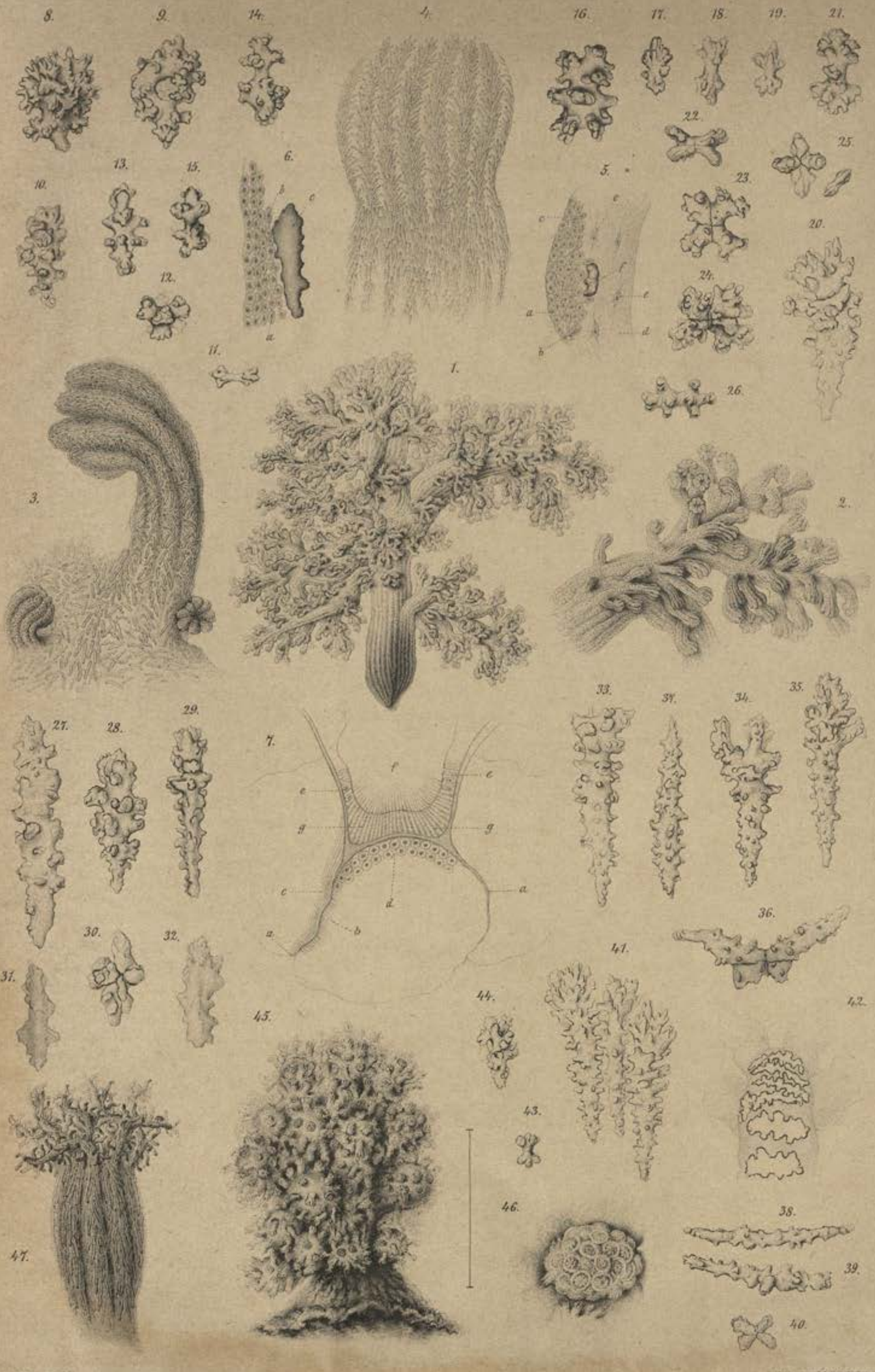
H. Bucher jun. del. Lith. Anst. v. J. G. Bach, Leipzig.

Duva flava, n. sp. 1-33. Duva glacialis, n. sp. 34-81. Duva cinerea, n. sp. 82-93.



Bucher jnr del. Lith. Anst. v. J. G. Bach, Leipzig.

Duva cinerea n. sp. Fig. 1-29 Drifa islandica n. sp. Fig. 30-71.



H. Bucher jun. del. lith.Anst.v. J.G.Bach, Leipzig.

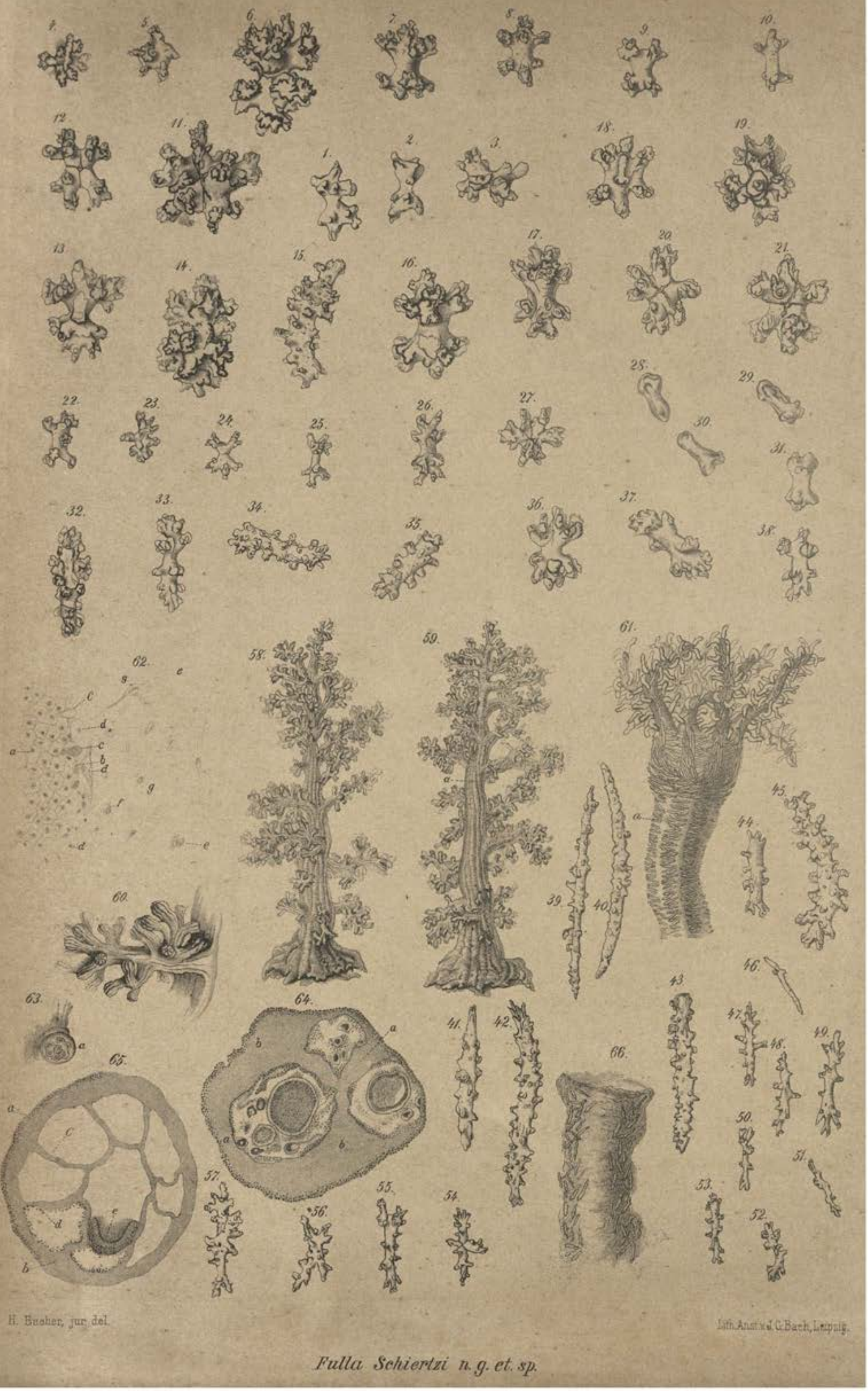
Drifa hyalina n. g. et. sp. 1-44. Nannodendron elegans n. g. et. sp. 45-47.

H. Bucher jun. del. Lith. Anst. v. J. G. Bach, Leipzig.

Nannodendron elegans n. g. et. sp.

H. Bucher jnr. del. Lith. Anst. v. J. G. Bach, Leipzig.

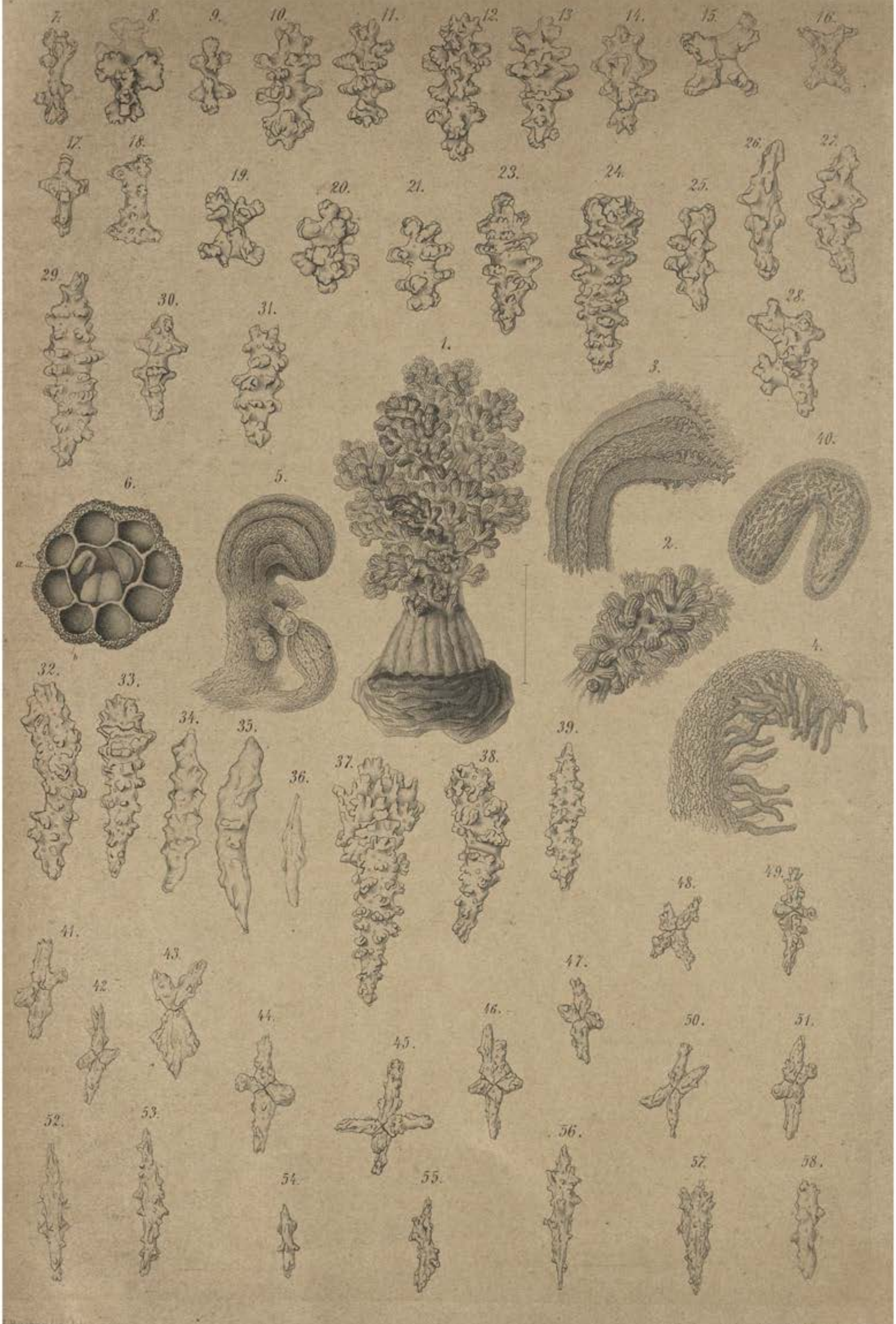
Vöringia polaris, n. sp. 1-40. Vöringia pygmæa, n. sp. 41-90.



H. Bucher, jur. del.

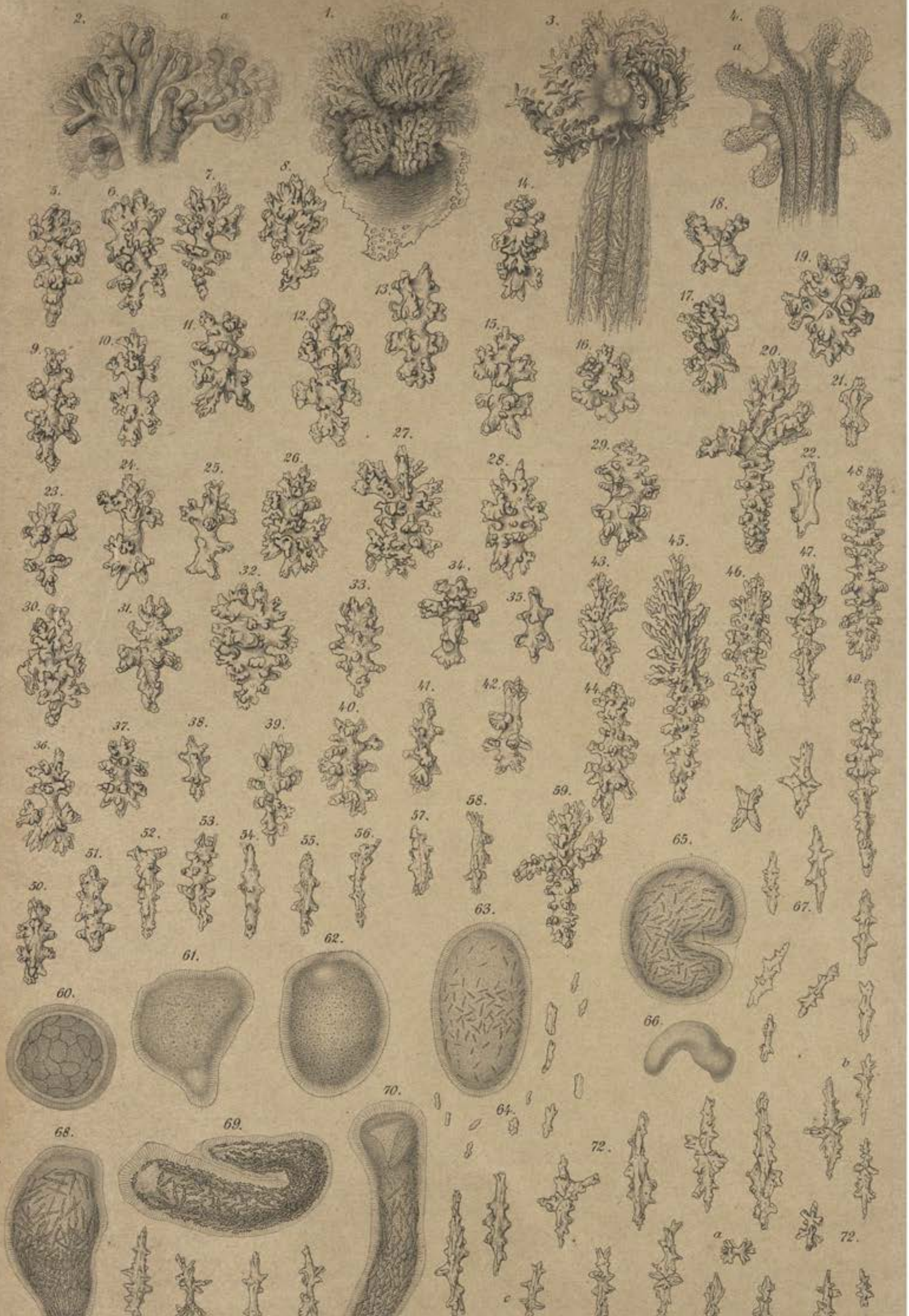
Lith. Anst. v. J. G. Bach, Leipzig.

Fulla Schiertzi n. g. et. sp.



I. Bucher nat. del. Lith. Anst. v. J. G. Bach, Leipzig.

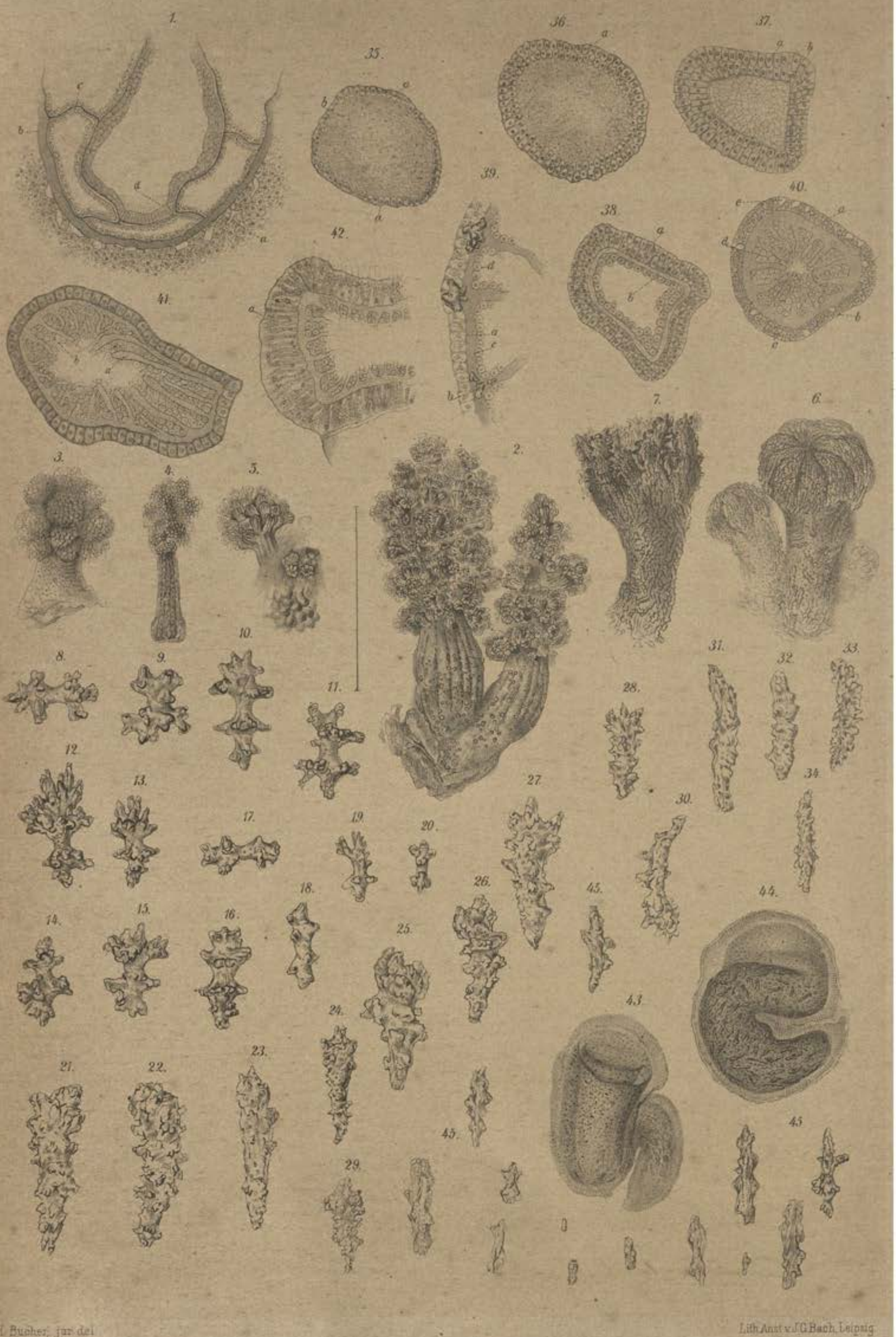
Nephthya flavescens, n. sp.



H. Bucher jun. del.

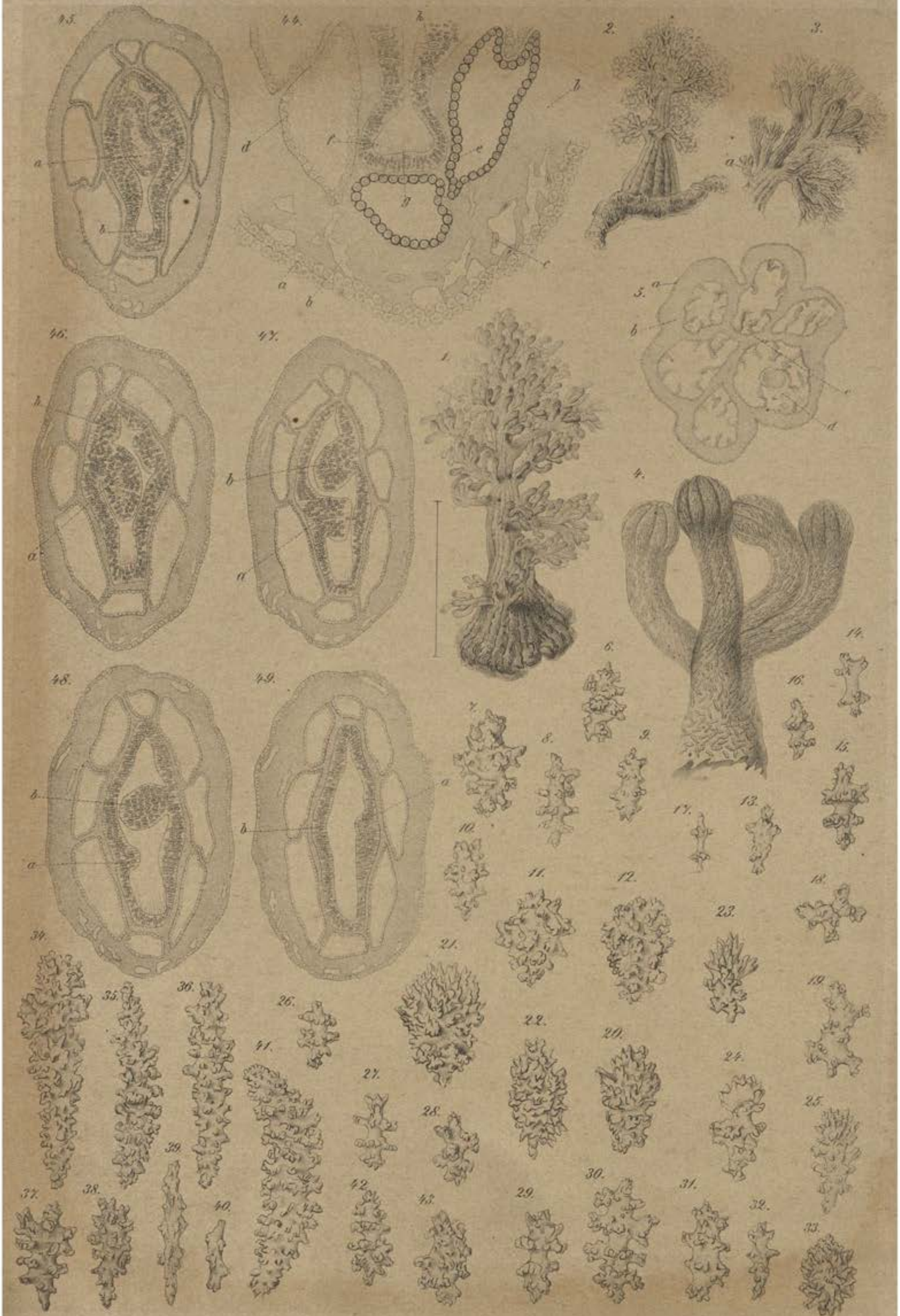
Lith. Anst. v. J. G. Bach Leipzig.

Nephthya rosea, n. sp.



H. Bucher, jur del. — Lith. Anst. v. J. G. Bach, Leipzig.

Nephthya rosea n. sp. 1. Nephthya polaris n. sp. 2–45.



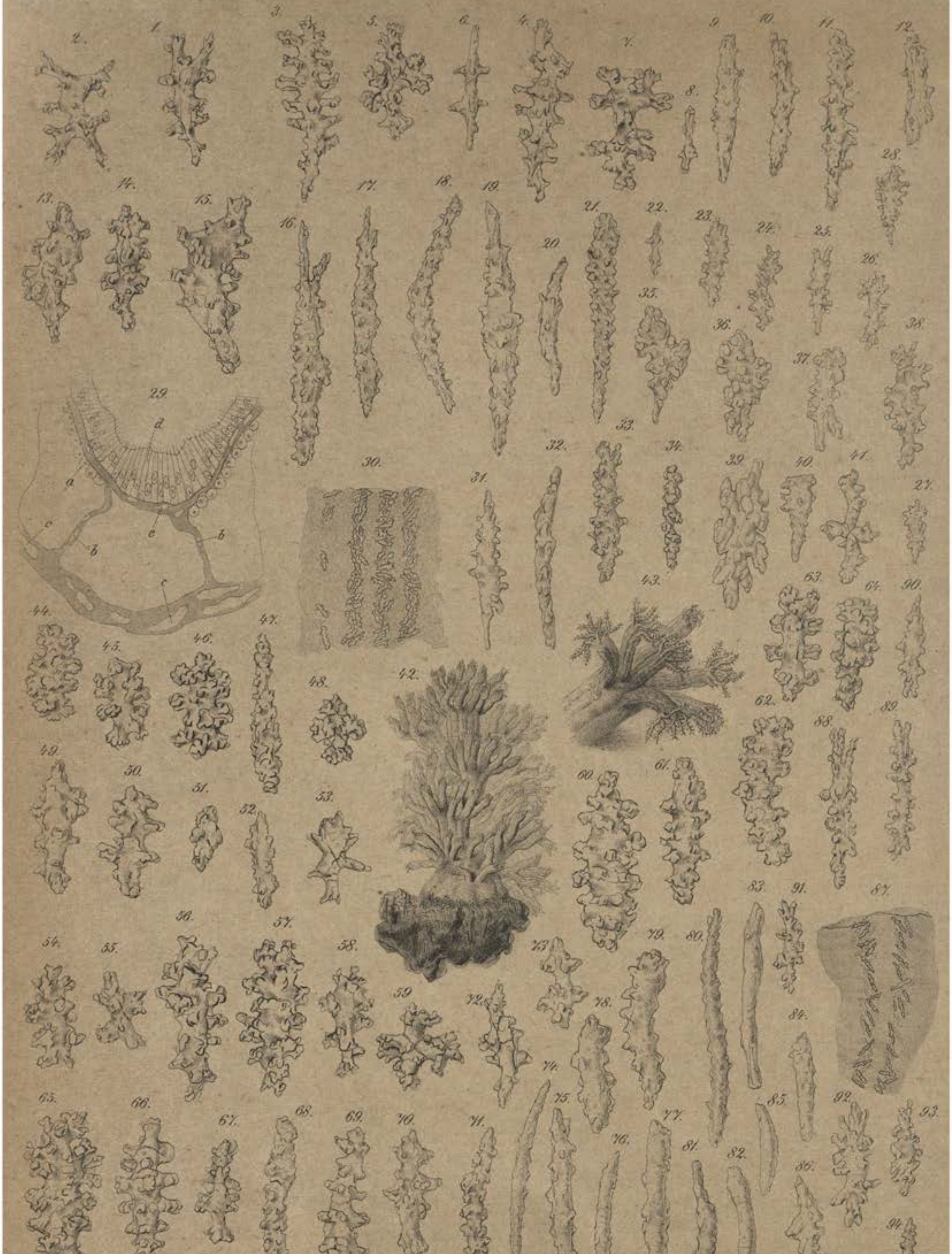
H. Bucher jun. del. Lith. Anst. v. J. G. Bach, Leipzig.

Gersemiopsis arctica n. g. et sp.

H. Buchse jnr. del.

Lith. Anst. v. J. G. Bach, Leipzig.

Gersemiopsis arctica n. g. et sp. 1-13. Barathrobius digitatus n. g. et sp. 14-70.



H. Bucher jnr del.

Lith. Anst. v. G. J. Bach, Leipzig.

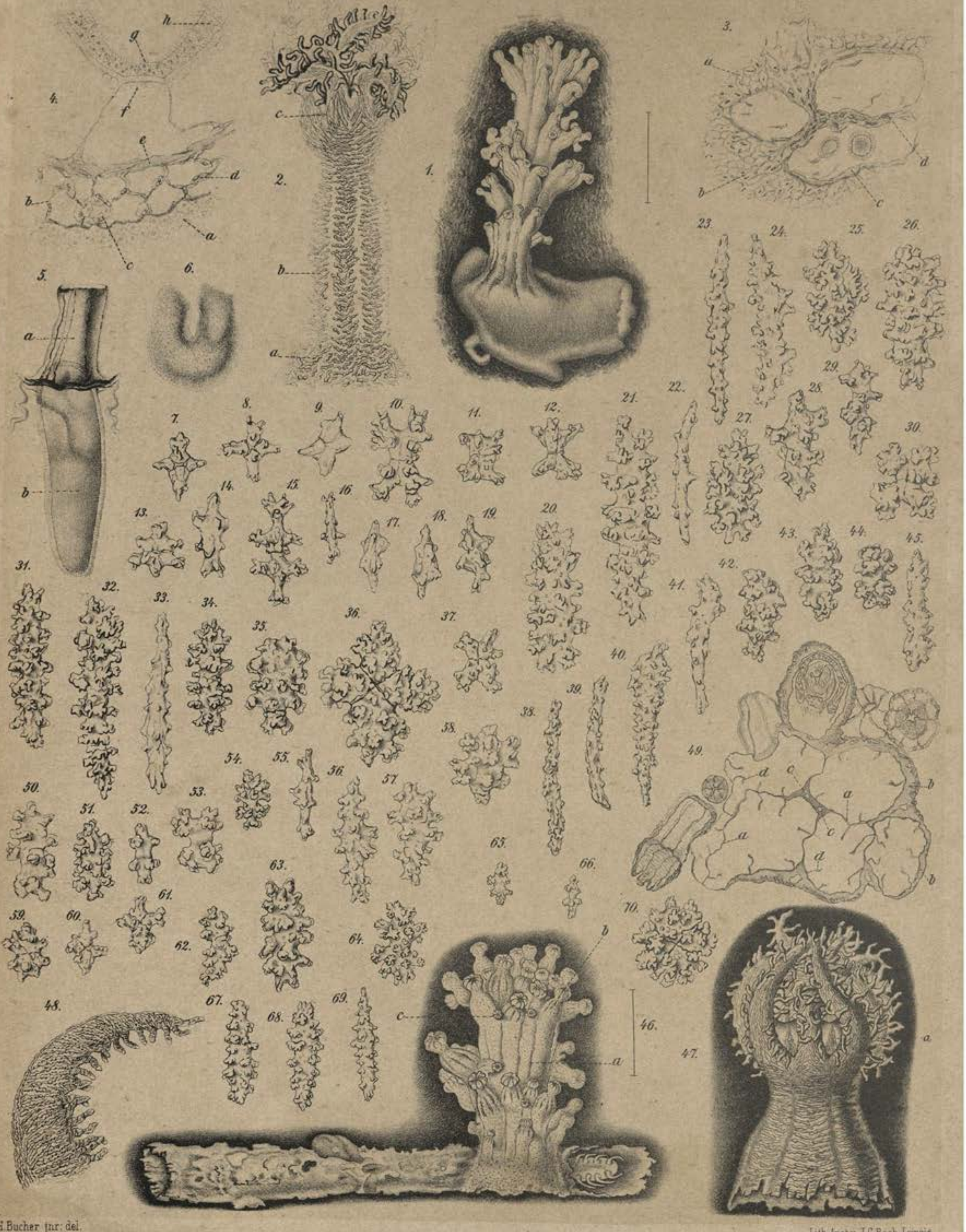
Barathrobius digitatus n. g. et sp. 1-41. Barathrobius palmatus, n. sp. 42-94.

H. Bucher jnr. del. Lith. Anst. v. J. G. Bach, Leipzig.

Sarakka crassa n. g. et. sp. Fig. 1-54. Vöringia dryopsis. n. sp. Fig. 55-60.

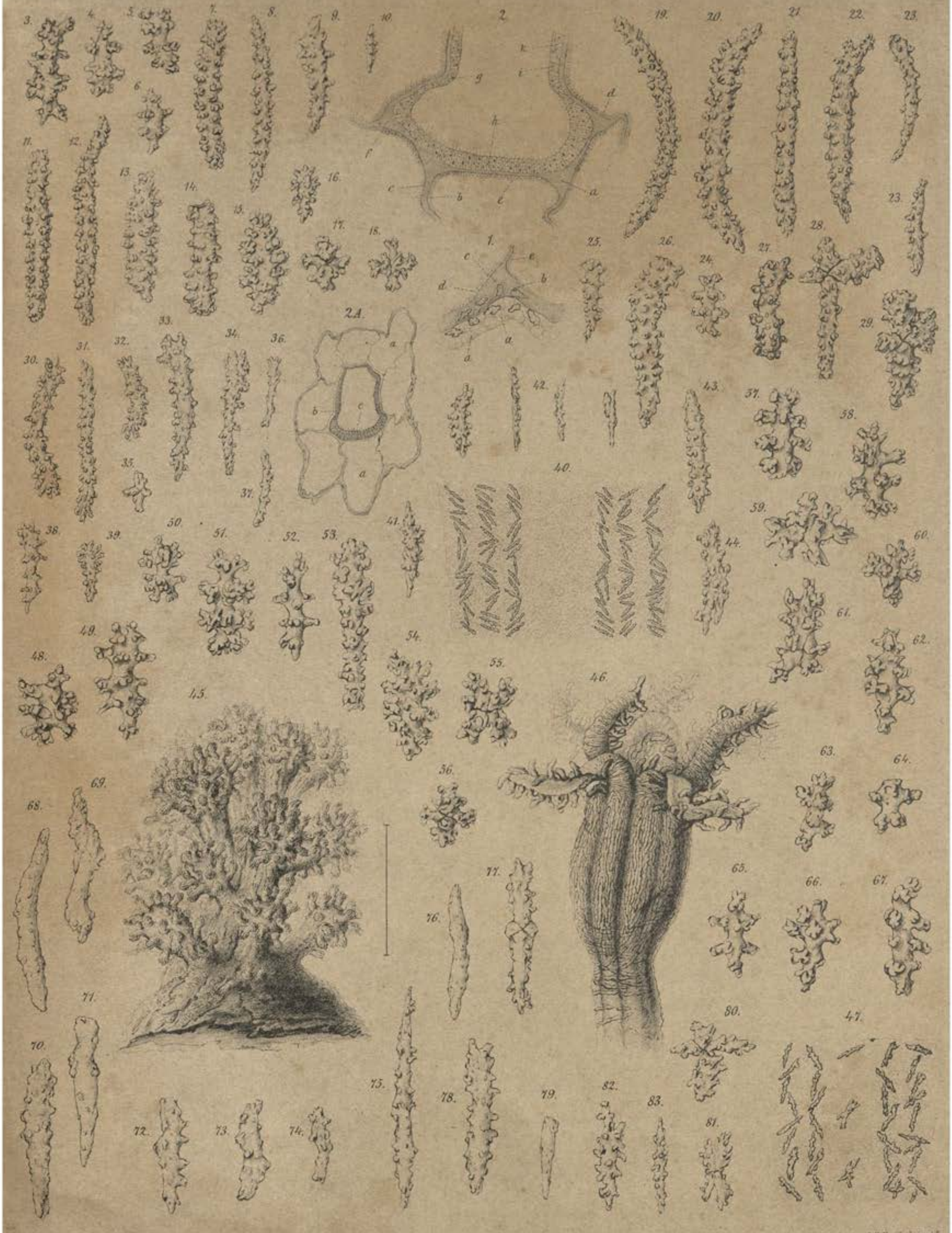
H. Bucher jun del. Lith. Anst. v. J. G. Bach, Leipzig

Vöringia dryopsis n. sp. Fig. 1-54. *Vöringia Jan-Mayeni* n. sp. Fig. 55-90.



H. Bucher jnr: del. Lith. Anst v. J. G. Bach, Leipzig.

Chrysofanes polaris n. g. et. sp. Fig. 1–45.
Organidus Nordenskjöldi, n. g. et. sp. Fig. 46–70.



H. Bucher jnr. del. Lith. Anst. v. J. G. Bach, Leipzig.

Organidus Nordenskjöldi n. g. et. sp. Fig. 1–44.
Vöring: clavata n. sp. Fig. 45–83.

DEN NORSKE NORDHAVS-EXPEDITION

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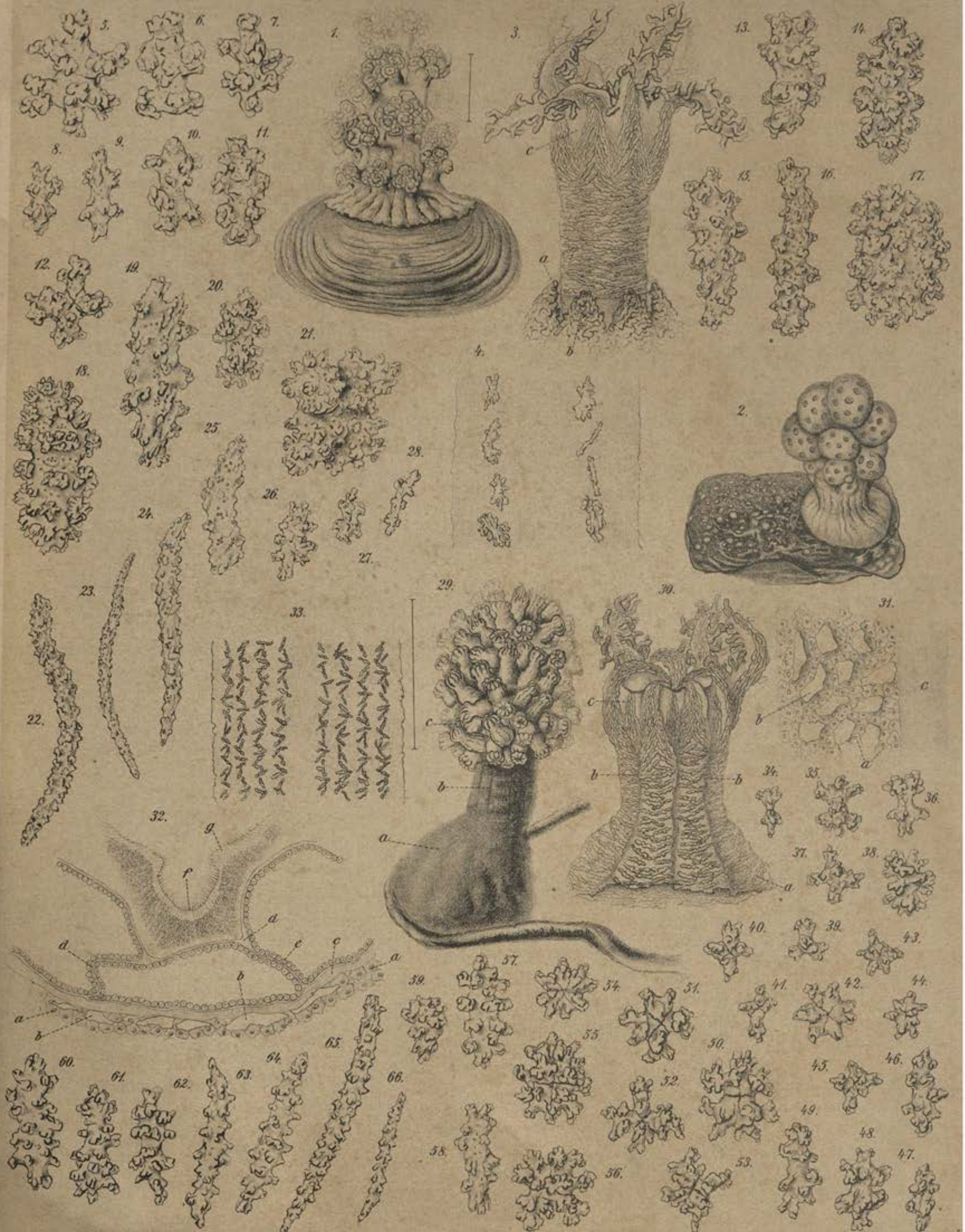


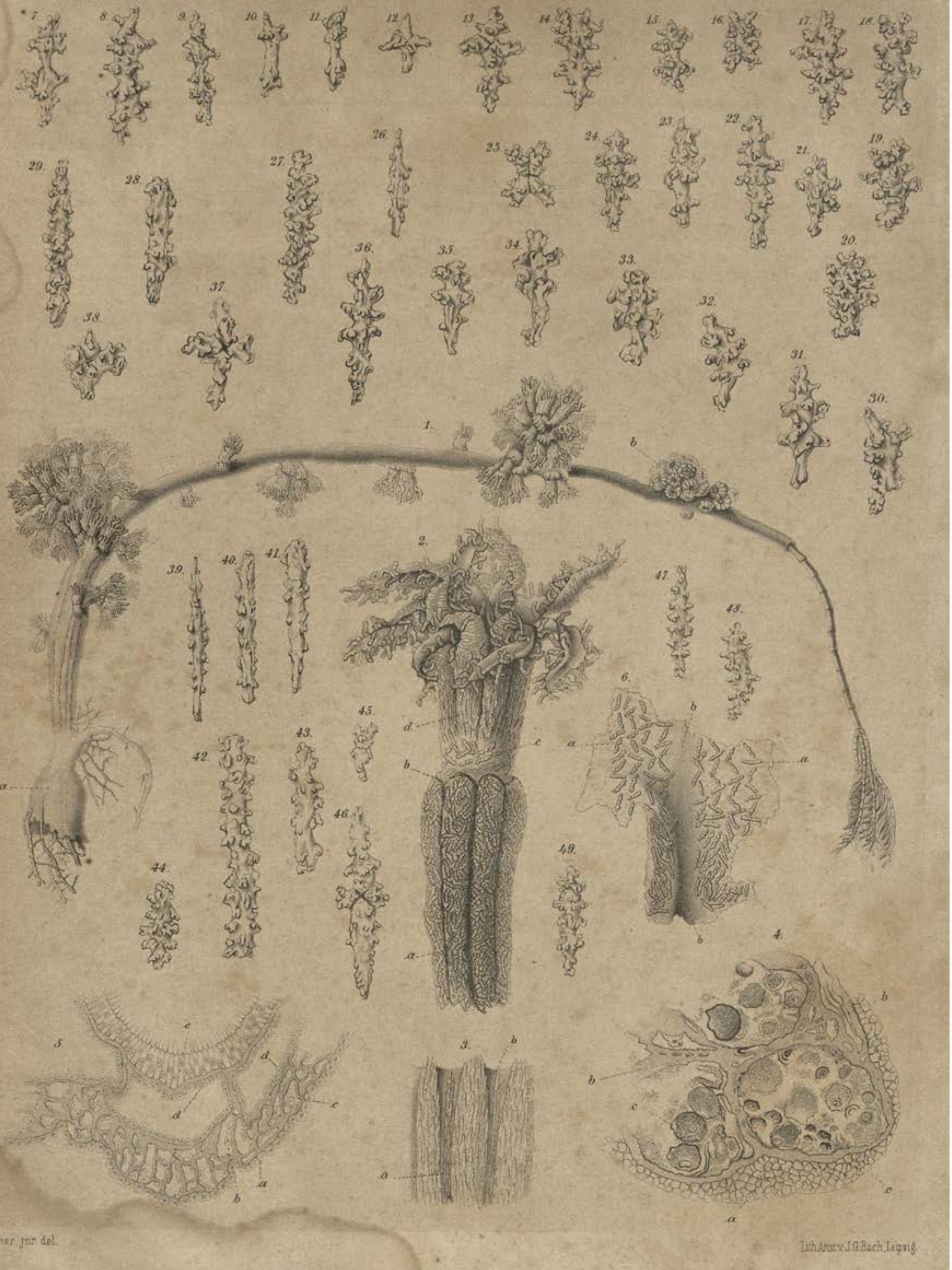
H. Bucher jnr. del. Lith. Anst. v. J. G. Bach, Leipzig.

Vöring: capitata n. sp. Fig. 1–28.
Nidalia arctica n. sp. Fig. 29–66.

Bucher jnr. del.

Lith. Anst. v. J. G. Bach, Leipzig.

Nidalia arctica n. sp. Fig. 67.–83. Clavularia frigida n. sp. Fig. 1–35.



ucher jnr del. Lith.Anst.v.J.G.Bach, Leipzig.

Sympodium abyssorum, n. sp.

Norske Nordhavs-Expedition.

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